

SERVICE MANUAL

CHASSIS 11AK19

FIRMEN: EUROLINE
 PALLADIUM
 S.E.G.
 TECHLINE
 VESTEL

CONTENTS

Contents	*	1
Safety Precautions	;	2
TV Set switched off		2
Measurements.		2
PERI-TV SOCKET		2
SCART 1		2
SCART 2		2
INTRODUCTION		2
SMALL SIGNAL PART WITH TDA884X		2-3
TUNER.		4
VIDEO SWITCH TEA6415C		4
AM DEMODULATOR TDA9830		4-5
DIGITAL TV SOUND PROCESSOR TDA9875		5
SOUND OUTPUT STAGE TDA2614/TDA2615/TDA2616Q		5
VERTICAL OUTPUT STAGE WITH TDA8351/TDA8356		6
VIDEO OUTPUT AMPLIFIER TDA6107Q		6
SINGLE/MULTISTANDARD VIF/SIF-PLL and FM-PLL/AM DEMODULATOR TDA9818		6
COMB FILTER SAA4961		6
POWER SUPPLY (SMPS).		6
MICROCONTROLLER SDA525X		6
SERIAL ACCESS CMOS 8K (1024*8) EEPROM ST24C08		6
CLASS AB STEREO HEADPHONE DRIVER TDA1308		7
SAW FILTERS		7
IC DESCRIPTIONS AND INTERNAL BLOCK DIAGRAM.		7
TDA8840H/DA8842/TDA8844		7-8
UV1315/UV1316/UV1336		9-10
TEA6415C		10
TDA9830		10
TDA2614/TDA2615/TDA2616Q		11-12
TDA8351/TDA8356		12
TDA6107Q		13
SAA4961		13-14
MC44604		14-15
SDA525X		16-17
TDA9875		17-18
TDA9818		18
ST24C08		18
TDA1308		18
G1965M		18
TDA9855		19
AK19 CHASSIS MANUAL ADJUSTMENT PROCEDURE		20
For Adjust Settings		20
WHITE BALANCE ADJUSTMENT		20
AGC ADJUSTMENT		20
IF-PLL NEGATIVE ADJUSTMENT		20
IF-PLL POSITIVE ADJUSTMENT		20
LUMINANCE DELAY ADJUSTMENT		20
VERTICAL ZOOM ADJUSTMENT		20
VERTICAL SCROLL ADJUSTMENT		20
4 : 3 HORIZONTAL SHIFT ADJUSTMENT		20
4 : 3 VERTICAL SLOPE ADJUSTMENT		20
4 : 3 VERTICAL AMPLITUDE ADJUSTMENT		21
4 : 3 S-CORRECTION ADJUSTMENT		21
4 : 3 VERTICAL SHIFT ADJUSTMENT		21
4 : 3 EW WIDTH ADJUSTMENT		21
4 : 3 EW PARABOLA WIDTH ADJUSTMENT		21
4 : 3 EW CORNER PARABOLA ADJUSTMENT		21
4 : 3 EW TRAPEZIUM ADJUSTMENT		21
16 : 9 HORIZONTAL SHIFT ADJUSTMENT		21
16 : 9 VERTICAL SLOPE ADJUSTMENT		21
16 : 9 VERTICAL AMPLITUDE ADJUSTMENT		21
16 : 9 S-CORRECTION ADJUSTMENT		21
16 : 9 VERTICAL SHIFT ADJUSTMENT		21
16 : 9 EW WIDTH ADJUSTMENT		21
16 : 9 EW PARABOLA WIDTH ADJUSTMENT		21
16 : 9 EW CORNER PARABOLA ADJUSTMENT		22
16 : 9 EW TRAPEZIUM ADJUSTMENT		22
For Option Settings		22
OPTION 00		22
OPTION 01		23
OPTION 02		23
OPTION 03		23-24
OPTION 04		24
OPTION 05		24
OPTION 06		24
OPTION 07		24-25
OPTION 08		25
OPTION 09		25
OPTION 10		25
GENERAL BLOCK DIAGRAM OF CHASSIS AK19		26
ELECTRONIC COMPONENT PART LIST		27-28

DO NOT CHANGE ANY MODULE UNLESS THE SET IS SWITCH OFF

The mains supply side of the switch mode power supply transformer is live.

Use an isolating transformer.

The receivers fulfill completely the safety requirements.

Safety precautions:

Servicing of this TV should only be carried out by a qualified person.

- Components marked with the warning symbol on the circuit diagram are critical for safety and must only be replaced with an identical component.

- Power resistor and fusible resistors must be mounted in an identical manner to the original component.

- When servicing this TV, check that the EHT does not exceed 26kV.

TV Set switched off:

Make short-circuit between HV-CRT clip and CRT ground layer.

Short C804 (150mF) before changing IC802 or other components in primary side of SMPS.

Measurements:

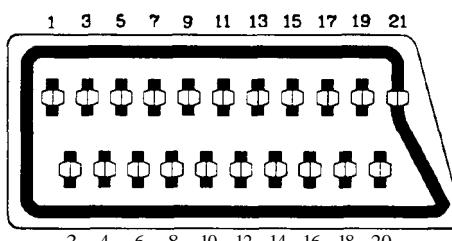
Voltage readings and oscilloscope traces are measured under following conditions.

Antenna signal 60dB from colourbar generator. (100% white, 75% colour saturation)

Brightness, contrast, colour set for a normal picture.

Mains supply, 220VAC, 50Hz.

PERI-TV SOCKET



SCART 1 (SC050)

1	Audio right output	0,5Vrms / 1 K
2	Audio right input	0.5Vrms/10K
3	Audio left output	0.5Vrms/1K
4	Ground AF	
5	Ground Blue	
6	Audio left input	0.5Vrms/10K
7	Blue input	0.7Vpp / 75ohm
8	AV switching input	0-12VDC/10K
9	Ground Green	
10	-	
11	Green input	0.7Vpp/75ohm
12	-	
13	Ground Red	
14	Ground Blanking	
15	Red input	0.7Vpp/75ohm
16	Blanking input	0-0.4VDC, 1-3VDC/75ohm
17	Ground CVS output	
18	Ground CVS input	
19	CVS output	1Vpp/75ohm
20	CVS input	1Vpp/75ohm
21	Ground	

SCART 2 (SC051)

1	Audio right output	0.SVrms / 1 K
2	Audio right input	0.5Vrms/10K
3	Audio left output	0.5Vrms/1K
4	Ground AF	
5	Ground Blue	
6	Audio left input	0.5Vrms/10K
7	Blue input	0.7Vpp / 75ohm
8	AV switching input	0-12VDC/10K
9	Ground Green	
10	-	
11	-	
12	-	
13	Ground Red	
14	Ground Blanking	
15	-	
16	-	
17	Ground CVS output	
18	Ground CVS input	
19	CVS output	1Vpp/75ohm
20	CVS input	1Vpp/75ohm
21	Ground	

1. INTRODUCTION

11AK19 is a 90e and 1100 chassis capable of driving 20-21", 24", 25", 28-29", 32", 33" tubes at appropriate currents.

The chassis is capable of working in both PAL and SECAM. The sound system is capable of giving 6watts RMS output into a load of 8ohms.

One 8 page simple TELETEXT, TOPTEXT and FASTEXT is provided.

The chassis is equipped with 21-pin scart connectors which can accept via scart the SVHS format from VCRs so equipped.

2. SMALL SIGNAL PART WITH TDA884X

The TDA8840/8842/8844 combine all small signal functions required for a colour TV receiver, except tuning.

2.1. Vision IF amplifier

The IF-amplifier contains 3 AC-coupled control stages with a total gain control range which is higher than 66dB.

The sensitivity of the circuit is comparable with that of modern IF-IC's. The video signal is demodulated by means of a PLL carrier regenerator. This circuit contains a frequency detector and a phase detector. The AFC output is obtained by using the VCO control voltage of the PLL and can be read via the PC-bus. For fast search tuning systems the window of the AFC can be increased with a factor 3. The setting is realised with the AFW bit.

Depending on the type the AGC-detector operates on top-sync level (single standard versions) or on top sync and top white-level (multi standard versions). The demodulation polarity is switched via the rc-bus. The AGC detector time-constant capacitor is connected externally. This mainly because of the flexibility of the application. The time-constant of the AGC system during positive

modulation is rather long to avoid visible variations of the signal amplitude, to improve the speed of the AUU system a circuit has been included which detects whether the AGC detector is activated every frame period. When during 3 frame periods no action is detected the speed of the system is increased. For signals without peak white information the system switches automatically to a gated black level AGC. Because a black level clamp pulse is required (or this way of operation the circuit will only switch to black level AGC in the internal mode).

The circuits contain a video identification circuit which is independent of the synchronisation circuit. Therefore search tuning is possible when the display section of the receiver is used as a monitor. The ident output is supplied to the tuning system via the PC-bus. The video ident circuit can be made less sensitive by means of the STM bit. This mode can be used during search tuning to avoid that the tuning system will stop at very weak input signals.

2.2. Video Switches

The circuits have two CVBS inputs (internal and external CVBS) and Y/C input. When the Y/C input is not required the Y input can be used as third CVBS input. The selection of the various sources is made via the PC-bus. The circuit has one CVBS output.

2.3. Sound Circuit

The sound band pass and trap filters have to be connected externally. The filtered intercarrier signal is fed to a limiter circuit and is demodulated by means of a PLL demodulator. This PLL circuit tunes itself automatically to the incoming carrier signal so that no adjustment is required.

The volume is controlled via the PC-bus. The deemphasis capacitor has to be connected externally. The non-controlled audio signal can be obtained from this pin. The FM demodulator can be muted via the PC-bus. This function can be used to switch-off the sound during a channel change so that high output peaks are prevented. The TDA8840/8842 contain an automatic volume levelling (AVL) circuit which automatically stabilises the audio output signal to a certain level which can be set by the viewer by means of the volume control. This function prevents big audio output fluctuations due to variations of the modulation depth of the transmitter. The AVL function can be activated via the PC-bus.

2.4. Synchronisation circuit

The sync separator is preceded by a controlled amplifier which adjusts the sync pulse amplitude to a fixed level. These pulses are fed to the slicing stage which is operating at 50% of the amplitude. The separated sync pulses are fed to the first phase detector and to the coincidence detector. This coincidence detector is used to detect whether the line oscillator is synchronised and can also be used for transmitter identification. The first PLL has a very high statical steepness so that the phase of the picture is independent of the line frequency.

The horizontal output signal is generated by means of an oscillator which is running at twice the line frequency. Its frequency is divided by 2 to lock the first control loop to the incoming signal. The time-constant of the loop can be forced by the PC-bus (fast or slow). If required the 1C can select the time-constant depending on the noise content of the incoming video signal.

To protect the horizontal output transistor, the horizontal drive is immediately switched off when a power-on-reset is detected.

The drive signal is switched-on again when the normal switch-on procedure is followed.

Via the PC-bus, adjustments can be made of the horizontal and vertical geometry. The vertical sawtooth generator drives the vertical output drive circuit which has a differential output current. For the EW drive a single ended current output is available.

When the horizontal scan is reduced to display 4 : 3 pictures on a 16 : 9 picture tube an accurate video blanking can be switched on to obtain well defined edges on the screen.

Overvoltage conditions can be detected via the EHT tracking pin. When an overvoltage condition is detected the horizontal output drive signal will be switched-off via the slow stop procedure but it is also possible that the drive is not switched-off and that just a protection indication is given in the PC-bus output byte. The choice is made via the input bit PRO.

2.5. Chroma and Luminance processing

The circuits contain a chroma bandpass and trap circuit. The filters are realised by means of gyrator circuits and they are automatically calibrated by comparing the tuning frequency with the X-tal frequency of the decoder.

The luminance delay line and the delay for the peaking circuit are also realised by means of gyrator circuits.

The centre frequency of the chroma bandpass filter is switchable via the PC-bus so that the performance can be optimised for "front-end" signals and external CVBS signals.

During SECAM reception the centre frequency of the chroma trap is reduced to get a better suppression of the SECAM carrier frequencies.

2.6. Colour Decoder

The decoder contains an alignment-free X-tal oscillator, a killer circuit and two colour difference demodulators. The 90° phase shift for the reference signal is made internally.

The 1C contains an automatic colour limiting (ACL) circuit which prevents that oversaturation occurs when signals with a high chroma-to-burst ratio are received. The ACL circuit is designed such that it only reduces the chroma signal and not the burst signal. This has the advantage that the colour sensitivity is not affected by this function.

The base-band delay line is integrated in the PAL/SECAM 1C's.

The demodulated colour difference signals are internally supplied to the delay line. The matrixed signals are externally available.

The colour difference matrix switches automatically between

PAL/SECAM and NTSC, however, it is also possible to fix the matrix in the PAL standard.

Which colour standard the 1C can decode depends on the external X-tals. The X-tal to be connected to pin 34 must have a frequency of 3.5 MHz (NTSC-M, PAL-M or PAL-N) and pin 35 can handle X-tals with a frequency of 4.4 and 3.5 MHz. To prevent calibration problems of the horizontal oscillator the external switching between the 2 X-tals should be carried out when the oscillator is forced to pin 35. For a reliable calibration of the horizontal oscillator it is very important that the X-tal indication bits (XA and XB) are not corrupted. For this reason the X-tal bits can be read in the output bytes so that the software can check the W-bus transmission.

2.7. RGB output circuit and black-current stabilisation

The colour-difference signals are matrixed with the luminance signal to obtain the RGB-signals. The TDA 884X device has one linear RGB input. This RGB signal can be controlled on contrast and brightness.

The output signal has an amplitude of about 2 volts black-to-white at nominal input signals and nominal settings of the controls.

To increase the flexibility of the 1C it is possible to insert OSD and/or teletext signals directly at the RGB outputs.

This insertion mode is controlled via the insertion input (pin 26 in the S-DIP 56- and pin 38 in the QFP-64 level). This blanking action at the RGB outputs has some delay which must be compensated externally.

To obtain an accurate biasing of the picture tube a "Continuous Cathode Calibration" circuit has been developed.

This function is realised by means of a 2-point black level stabilisation circuit.

When the TV receiver is switched-on, the RGB output signals are blanked and the black current loop will try to set the right picture tube bias levels. Via the AST bit a choice can be made between automatic start-up or a start-up via the micro-processor.

3. TUNER

Either a PLL or a VST tuner is used as a tuner.

UV1316 (VHF/UHF) is used as a PLL tuner. For only PALM/N, NTSC M applications UV 1336 is used as the PLL tuner. UV 1315 (VHF/UHF) is used as a VST Tuner.

Channel coverage of UV1316:

BAND	OFF-AIR CHANNELS		CABLE CHANNELS	
	CHANNELS RANGE (MHz)	FREQUENCY	CHANNELS	FREQUENCY RANGE (MHz)
Low Band	E2toC	48.25 to 82.25 (1)	S01 to S08	69.25 to 154.25
Mid Band	E5toE12	175.25 to 224.25	S09 to S38	161.25 to 439.25
High Band	E21 to E69	471.25 to 855.25 (2)	S39 to S41	447.25 to 463.25

(1). Enough margin is available to tune down to 45.25 MHz.

(2). Enough margin is available to tune up to 863.25 MHz.

Noise	Typical	Max.	Gain	Min.	Typical	Max.
Low band	: 5dB	9dB	All channels	: 38dB	44dB	52dB
Mid band	: 5dB	9dB	Gain Taper (of-air channels)	: -		8dB
High band	: 6dB	9dB				

Channel Coverage UV1336:

BAND	CHANNELS	FREQUENCY RANGE (MHz)
Low Band	2toD	55.25 to 139.25
Mid Band	EtoPP	145.25 to 391.25
High Band	QQ to 69	397.25 to 801.25

Noise is typically 6dB for all channels. **Gain** is minimum 38dB and maximum 50dB for all channels.

Channel Coverage of UV1315:

BAND	OFF-AIR CHANNELS		CABLE CHANNELS		
	CHANNELS	FREQUENCY RANGE (MHz)	CHANNELS	FREQUENCY RANGE (MHz)	
Low Band	E2toC	48.25(082.25(1)	S01 to S10	69.25 to 168.25	
Mid Band	E5 to E12	175.25 to 224.25	S11 to S39	231.25 to 447.25	
High Band	E21 to E69	471.25 to 855.25 (2)	S40 to S41	455.25 to 463.25	

(1). Enough margin is available to tune down to 45.25 MHz.

(2). Enough margin is available to tune up to 863.25 MHz.

Noise	Typ.	Max.	Gain	Min.	Typ.	Max.
Low band	: 6dB	9dB	All Channels	38dB	44dB	50dB
Mid band	: 6dB	10dB	Gain Taper	-	-	8dB
High band	: 6dB	11dB	(off-air channels)			

4. VIDEO SWITCH TEA6415C

In case of three or more external sources are used, the video switch 1C TEA6415C is used. The main function of this device is to switch 8 video input sources on the 6 outputs.

Each output can be switched on only one of each input. On each input an alignment of the lowest level of the signal is made (bottom of sync. top for CVBS or black level for RGB signals).

Each nominal gain between any input and output is 6.5dB. For D2MAC or Chroma signal the alignment is switched off by forcing, with an external resistor bridge, 5VDC on the input. Each input can be used as a normal input or as a MAC or Chroma input (with external resistor bridge). All the switching possibilities are changed through the BUS.

Driving 75ohm load needs an external resistor.

It is possible to have the same input connected to several outputs.

5. AM DEMODULATOR TDA9830

The TDA9830 is designed for AM-sound demodulation used in L and L" standard.

Sound IF Input:

The sound IF amplifier consists of three AC-coupled differential amplifier stages each with approximately 20dB gain. At the output of each stage is a multiplier for gain controlling. The overall control range is approximately -6 to +60dB and the frequency response (-3dB) of the IF amplifier is approximately 6 to 70MHz. The steepness of gain control is approximately 10mV/dB.

IFAGC:

The automatic gain control voltage to maintain the AM demodulator output signal at a constant level is generated by a mean level detector. The AGC-detector charges and discharges the capacitor at pin 3 controlled by the output signal of the AM-demodulator compared to an internal reference voltage. The maximum charge/discharge current is approximately 5 mA.

AM-demodulator

The IF amplifier output signal is fed to a limiting amplifier (two stages) and to a multiplier **circuit**. However the limiter output signal (which is not any more AM modulated) is also fed to the multiplier, which provides AM demodulation (in phase demodulation). After lowpass **filtering (fg @ 400kHz) for carrier rejection and buffering**, the demodulator output signal is present at **pin 6**.

Audio Switch

This circuit is an operational amplifier with three input stages and internal feedback network determining gain (0dB) and frequency response (fg @ 700kHz). Two of the input stages are connected to pin 7 and pin 9, the third input stage to an internal reference voltage. Controlled by the switching pins 10 and 12, one of the three input stages can be activated and a choice made between two different AF signals or mute state. The selected signal is present at pin 8. The decoupling capacitors at the input pins are needed, because the internally generated bias voltage for the input stages must not be influenced by the application in order to avoid OC-plop in case of switching.

Reference Circuit:

This circuit is a band gap stabiliser in combination with a voltage regulation amplifier, which provides an internal reference voltage of about 3.6V nearly independent from supply voltage and temperature. This reference voltage is filtered by the capacitor at pin 4 in order to reduce noise. It is used as a reference to generate all important voltages and currents of the circuit. For application in 12V power supply concepts, there is an internal voltage divider in combination with a Darlington transistor in order to reduce the supply voltage for all 1C function blocks to approximately 6V.

6. DIGITAL TV SOUND PROCESSOR TDA9875

The TDA9875 is a single-chip Digital TV Sound Processor.

Supported standards are M, B/G, D/K, I and L.

Description of the demodulator and decoder section:

SIF Input:

Two input pins are provided, SIF1 e.g. for terrestrial TV **and** SIF2 e.g. for a satellite tuner. The selected signal is passed through an AGC circuit and then digitized by an 8-bit ADC operating at 24.576MHz.

AGC:

The gain of the AGC amplifier is controlled from the ADC output by means of a digital control loop employing hysteresis. The AGC has a fast attack behaviour to prevent ADC overloads and slow decay behaviour AGC oscillations. For AM demodulation AGC must be switched off.

Mixer

The digitized input signal is fed to the mixers, which mix one or both input sound carriers down to zero IF. A 24-bit control word for each carrier sets the required frequency.

FM and AM Demodulation

An FM or AM input signal is fed via a band-limiting filter to a demodulator that can be used for either FM or AM demodulation. Apart from the standard (fixed) de-emphasis characteristic, an adaptive de-emphasis is available for encoded satellite programs. A stereo decoder recovers the left and right signal channels from the demodulated **sound carriers**.

FM Identification:

The identification of the FM sound mode is performed by AM synchronous demodulation of the pilot signal and narrow-band detection of the identification frequencies. The result is available via the TC-bus interface.

NICAM Demodulation:

The NICAM signal is transmitted in a DQPSK code at a bit rate of 728 kbit/s. The NICAM demodulator performs DQPSK demodulation and feeds the resulting bitstream and clock signal onto the NICAM decoder and, for evaluation purposes, to PCLK (pin 1) and NICAM (pin 2).

NICAM Decoder:

The device performs all decoding functions in accordance with the "EBU NICAM 728 specification". After locking to the frame alignment word, the data is descrambled by applying the defined pseudo-random binary sequence; the device will then synchronise to the periodic frame flag bit CO.

The status of the NICAM decoder can be read out from the NICAM status register by the user. The OSB bit indicates that the decoder has locked to the NICAM data. The VDSP bit indicates that the decoder has locked to the NICAM data and that the data is valid sound data.

7. SOUND OUTPUT STAGE TDA2614H'DA2615n'DA26160

TDA2614 is used as the AF output amplifier for mono applications. It is supplied by ± 12 VDC coming from a separate winding in **the** SMPS transformer. An output power of 2'6W (THD=0.5%) can be delivered into an 8ohm load.

TDA2615 is used as the AF output amplifier for stereo applications. It is supplied by ± 12 VDC coming from a separate winding in the SMPS transformer. An output power of 2'6W (THD=0.5%) can be delivered into an 8ohm load.

TDA2616Q is used as the AF output amplifier for stereo and dolby prologic applications. It is supplied by ± 16 VDC coming from a separate winding in the SMPS transformer. An output power of 2'12W (THD=0.5%) can be delivered into an 8ohm load.

8. VERTICAL OUTPUT STAGE WITH TDA8351/8356

The TDA8351/8356 vertical deflection circuit can be used in 90° and 110° deflection systems with field frequencies from 50 up to 1201-fz. With its bridge configuration the deflection output can be DC coupled with few external components. Only a single supply voltage for the scan and a second supply for the flyback are needed. The TDA8356 is intended for 90° systems and the TDA8351 is intended for 110° systems.

The drive voltage is amplified by an amplifier and fed to two amplifiers, one is inverting and the other is a non inverting amplifier. The outputs (pins 7 and 4) are connected to the series connection of the vertical deflection coil and feedback resistor Rsense (R702/R703). The voltage across Rsense is fed via pin 9 to correction amplifier, to obtain a deflection current which is proportional to the drive voltage. The supply voltage for the TDA8351/8356 is 15VDC at pin 3. The supply voltage generator has a separate supply voltage of 45VDC at pin 6.

9. VIDEO OUTPUT AMPLIFIER TDA6107Q

The TDA6107Q consists of three monolithic video output amplifiers. The amplifier can be seen as an operational amplifier with negative feedback.

The advantage of negative feedback is that the amplifier characteristics do not play an important role up to certain frequencies. The internal flash diodes protect the amplifiers against flash over in the picture tube.

The only protections required at the cathode outputs are a flash resistor and a sparkgap.

The TDA6107Q has an internal thermal protection circuit which gives a decrease of the slew rate at high temperatures.

Furthermore, the device needs only one power supply voltage (Vdd).

In contrast to previous types of DMOS video amplifiers, all the external resistors (Rf, Ri and Ra) are integrated, so the gain is fixed and saves 9 resistors.

Furthermore, the reference voltage is integrated, it saves a resistor divider and a decoupling capacitor. So, the replacement value of the TDA6107Q is very high.

The TDA6107Q is provided with a black current data pin. Since TDA884X is used as drive device, no adjustments are required for gain and black setting, as the TDA884X has PC white point adjustment and black current set-up.

10. SINGLE/MULTISTANDARD VIF/SIF-PLL and FM-PLUAM

DEMODULATOR TDA9818

The TDA9818 is an 1C for multistandard vision IF signal processing, sound AM and FM demodulation.

It is a gain controlled wide band VIF-amplifier (AC-coupled). It is applicable (or IP frequencies of 38.9 MHz, 45.75 MHz and 58.75 MHz. True synchronous demodulation is provided with active carrier regeneration. It has a VCO frequency which can be switchable between L and L' accent (alignment external) picture carrier frequency.

The TDA9818 has a SIF input for single reference QSS mode (PLL controlled). SIF AGC detector is to provide gain controlled SIF amplifier. The AM demodulator is without extra reference circuit. The supply voltage is +5VDC at pin 21.

11. COMBFILTER SAA4961

The SAA 4961 is a one-chip, PAL/NTSC combfilter 1C with internal delay lines, filters, clock control, synchronisation and signal switches. The combfilter function is realised in a switched capacitor technique, so it has time discrete but amplitude continuous processing.

The Y/CVBS input is first clamped and then fed to the delay-line and combfilter section via a low pass pre-filter

This filter can be bypassed via the external LPF-on pin. This pin is internally pulled up, to put the filter default on. The Y/CVBS input is also fed to the sync separator, where horizontal and vertical reference pulses are made.

Bypass mode can be forced via BYP (pin 3).FSC (pin 1) is the subcarrier input which is connected to the colour decoder.

Input FSCSW pin indicates if fsc or 2*fsc is used.

The Sys1,2 pins (20, 23) indicate which system standard is processed. Sys2 is internally pulled up, Sys1 is internally pulled down. Therefore when the Sys1,2 inputs are left open, automatically PAL 4.43MHz is forced.

SAA4961 output pin 15 "CVBS" can be used for parallel-synced teletext decoders, to guarantee that the teletext display always has a correct timing relation with the main picture. Comb filter is disabled by setting SAA4961 pin 3 "BYP" high.

12. POWER SUPPLY (SMPS)

The DC voltages required at various parts of the chassis are provided by an SMPS transformer controlled by the 1C MC44604 which is designed (or driving, controlling and protecting switching transistor of SMPS. The transformer produces 150/115V for FBT input, ±14V for audio output 1C, S+5V for microcontroller, +15V for vertical output (field scan) and +33V for tuner and some other ICs and transistors.

13. MICROCONTROLLER SDA525X

The device is TV TEXT tuning and control system based on the SDA 525X TV TEXT microcontroller. It is designed for a low cost mono TV-SET with analogue picture and sound control. Nevertheless the system offers an on screen display (OSD) and IR remote control of all functions.

SDA525X has the following features:

- Display of program number, channel number, TV standard, analogue values, sleep timer, parental control, and mute is done by OSD.
- Single LED for IR active, standby and on mode indication.
- 1 Control line to select external source.
- 3 Control lines for TV standard selection.
- Frequency synthesis tuning (62.5 kHz steps)
- 1.92 step fine tuning
- Channels corresponding to standards B/G, OIRT, L and I (I+)
- Mono sound control by analogue voltage
- System configuration with service mode

14. SERIAL ACCESS CMOS 8K (1024*8) EEPROM ST24C08

The ST24C08 is an 8Kbit electrically erasable programmable memory (EEPROM), organised as 4 blocks of 256*8 bits.

The memory is compatible with the PC standard, two wire serial interface which uses a bi-directional data bus and serial clock.

The memory carries a built-in 4 bit, unique device identification code (1010) corresponding to the PC bus definition.

This is used together with 1 chip enable input (E) so that up to 2*8K devices may be attached to the K; bus and selected individually.

15. CLASS AB STEREO HEADPHONE DRIVER TDA1308

The TDA1308 is an integrated class AB stereo headphone driver contained in a DIPS plastic package. The device is fabricated in a 1 mm CMOS process and has been primarily developed for portable digital audio applications.

16. SAWFILTERS

Saw filter type Model:

G1965M	PAL-SECAM B/G MONO
G3962M	PAL-SECAM B/G GER&NIC STEREO, PAL I' NIC STEREO, INT.1
G1984	PAL-SECAM B/G GER&NIC STEREO INT-2
J1951M	PAL-IMONO
J3950M	PAL-I NIC STEREO
J1956M	PAL-I'MONO
K2955M	PAL-SECAM B/G-D/K MONO, PAL-SECAM B/G-D/K-I', MONO, PAL-SECAM B/G-D/K-L MONO
K2958M	PAL-SECAM B/G-D/K (38) MONO
K2962M	PAL-SECAM B/G-LA' MONO
G3957M	PAL-SECAM B/G-L/L' GER&NIC BQ/L STEREO
K6256K	PAL-SECAM B/G-D/K-I-L/L MONO, PAL-SECAM B/G-D/K-I, L/L' GER&NIC BG/L STEREO, PAL-SECAM B/G-D/K-I-L/L I, NICAM STEREO, PAL-SECAM B/G-D/K-I-HA' GER&NIC I'-B/G-L, STEREO
K6259K	PAL-SECAM B/G-D/K-I-M/N (EURO) MONO
M1963M	PAL M/N MONO, NTSC M MONO, PAL M/N-NTSC M MONO

17. BTSC STEREO/SAP/DBX-DECODER and AUDIO PROCESSOR TDA9855

The TDA9855 is a BTSC stereo/SAP/dbx decoder and audio processor. It performs all functions to transform the composite baseband signal into the appropriate audio output signals to line out and to the loudspeaker output stages.

1C DESCRIPTIONS AND INTERNAL BLOCK DIAGRAM

TDA8840/8842/8844
TUNER (UV1315, UV1316, UV1336)
TEA6415C
TDA9830
TDA2614/2615/2616Q
TDA8351/8356
TDA6107Q
SAA4961
MC44604
SDA525X
TDA9875
TDA9818
ST24C08
TDA1308
G1965M
TDA9855

TDA8840/8842/8844:

The TDA884X is I²C-bus controlled single chip TV processor which is intended to be applied in PAL, NTSC, PAL/NTSC and multi-standard television receivers. These 1C's are nearly pin compatible with the TDA837X TV processors but have a higher degree of integration because the delay line (TDA4665 function) and the SECAM decoder have been integrated. In addition to these functions some additional features have been added like "Continuous Cathode Calibration" (2-point black current loop which results in an accurate biasing of the 3 guns), adjustable luminance delay time, blue stretching and dynamic skin tone control.

Features:

- Vision IF circuit with PLL demodulator
- Alignment-free multi-standard FM sound demodulator (4.5 MHz to 6.5 MHz)
- Audio switch
- Flexible source selection with CVBS switch and Y(CVBS)/C input so that a comb filter can be applied
- Integrated chrominance trap circuit
- Integrated luminance delay line
- Asymmetrical peaking in the luminance channel with a noise coring function
- Black stretching of non-standard CVBS or luminance signals
- Integrated chroma band-pass filter with switchable center frequency
- Blue stretch circuit which offsets colours near white towards blue
- RGB control circuit with "Continuous Cathode Calibration" and white point adjustment
- Linear RGB inputs and fast blanking
- Possibility to insert a "blue black" option when no video signal is available
- Horizontal synchronisation with two control loops and alignment-free horizontal oscillator
- Vertical count-down circuit
- Vertical driver optimised for DC-coupled vertical output stages
- I²C-bus control of various functions
- Low dissipation (850 mW)

Functional Differences between the 8840/8842/8844:

1C VERSION (TDA)	8840	8842	8844
Multi-standard IF		X	X
Automatic Volume Limiting	X	X	
PAL Decoder		X	X
SECAM Decoder		X	X
NTSC Decoder		X	X
Dynamic Skin Control			X
Colour Matrix PAL/NTSC (Japan)		X	X
Colour Matrix NTSC Japan/USA			
YUV interface			X
Base-band delay line	X	X	X
Adjustable luminance delay time			X
Horizontal geometry			X
Horizontal and vertical zoom			X
Vertical scroll			X
PINNING			
1. Sound IF input			
2. External audio input			
3. IF demodulator tuned circuit 1			
4. IF demodulator tuned circuit 2			
5. IF-PLL loop filter			
6. IF video output			
7. Serial clock input			
8. Serial data input/output			
9. Bandgap decoupling			
10. Chrominance input (S-VHS)			
11. External CVBS/Y input			
12. Main supply voltage 1			
13. Internal CVBS input			
14. Ground 1			
15. Audio output			
16. SECAM PLL decoupling			
17. External CVBS input			
18. Black-current input			
19. Blue output			
20. Green output			
21. Red output			
22. Beam current limiter input/V-guard input			
23. Red input for insertion			
24. Green input for insertion			
25. Blue input for insertion			
26. RGB insertion input			
27. Luminance input			
28. Luminance output			
29. (B-Y) signal output			
30. (R-Y) signal output			
31. (B-Y) signal input			
32. (R-Y) signal input			
33. Subcarrier reference output			
34. 3.58 MHz crystal connection			
35. 4.43/3.58 MHz crystal connection			
36. Loop filter phase detector			
37. 2nd supply voltage 1			
38. CVBS output			
39. Decoupling digital supply			
40. Horizontal output			
41. Flyback input/sandcastle output			
42. Phase-2 filter			
43. Phase-1 filter			
44. Ground 2			
45. East-west drive output			
46. Vertical drive A output			
47. Vertical drive B output			
48. IF input 1			
49. IF input 2			
50. EHT/overvoltage protection input			
51. Vertical sawtooth capacitor			
52. Reference current input			
53. AGC decoupling capacitor			
54. Tuner AGC output			
55. Audio deemphasis			
56. Decoupling sound demodulator			
PIN VALUE			
: ImVrms			
: SOOrnVrms			
Min:32-Max:60 MHz			
4.7V (Negative Modulation), 2V (Positive Modulation)			
Low level max:!.5 V, High level min 3.5V			
Low level max:1.5 V, High level min 3.5V			
1Vpp, Max:1.4Vpp			
1 Vpp, Max: 1.4Vpp			
8V, Min:7.2V, Max:8.8V			
1Vpp, Max:1.4Vpp			
700mVrms, Min:500mVrms, Max:900mVrms			
Vpp, Max:1.4Vpp			
Amplitude of "low" reference current : 8mA			
Amplitude of "high" reference current : 20mA			
2Vpp			
2Vpp			
2Vpp			
0.7Vpp, Max:0.8Vpp			
0.7Vpp, Max:0.8Vpp			
0.7Vpp, Max:0.8Vpp			
Max:0.3V			
1.4Vpp			
1 -4Vpp			
1.05Vpp			
1.05Vpp			
1.05Vpp			
1.05Vpp			
3.58/4.43 MHz			
8V, Min:7.2V, Max:8.8V			
1 Vpp, Max: 1.4Vpp			
1.8V			
Max: 0.3V			
Min:100mA, Max:300mA			
150 ms/ms			
±0.9 kHz, Max: ±1.2 kHz			
0.95mA			
0.95mA			
Min: 1.2V, Max : 2.8V			
3Vpp			
3Vpp			
Max:9V (Maximum tuner AGC Output voltage), 300mV (Output saturation voltage)			
500mVrms			

UV1315,UV1316,UV1336

General description of UV1315:

The UV1315 tuner belongs to the UV 1300 family of tuners, which are designed to meet a wide range of applications. It is a combined VHF, UHF tuner suitable for CCIR systems B/G, H, L, L', I and I'. The low IP output impedance has been designed for direct drive of a wide variety of SAW filters with sufficient suppression of triple transient.

Features of UV1315:

- Member of the UV1300 family small sized UHF/VHF tuners
- Systems CCIR:B/G, H, L, L', I and I'; OIRT:D/K
- Voltage synthesized tuning (VST)
- Off-air channels, S-cable channels and Hyperband
- Standardized mechanical dimensions and pinning
- Compact size

PINNING	PIN VALUE
Gain control voltage (AGC)	4.0V, Max:4.5V
Tuning voltage	
High band switch	5V, Min:4.75V, Max:5.5V
Mid band switch	5V, Min:4.75V, Max:5.5V
Low band switch	5V, Min:4.75V, Max:5.5V
Supply voltage	5V, Min:4.75V, Max:5.5V
Not connected	
Not connected	
Not connected	
10. Symmetrical IF output 1	
11. Symmetrical IF output 2	

Bandswitching table:

	Pin 3	Pin 4	Pin 5
Low band	0V	0V	+5V
Mid band	0V	+5V	0V
High band	+5V	0V	0V

General description of UV1316:

The UV1316 tuner belongs to the UV 1300 family of tuners, which are designed to meet a wide range of applications. It is a combined VHF, UHF tuner suitable for CCIR systems B/G, H, L, L', I and I'. The low IF output impedance has been designed for direct drive of a wide variety of SAW filters with sufficient suppression of triple transient

Features of UV1316:

- Member of the UV1300 family small sized UHF/VHF tuners
- Systems CCIR: B/G, H, L, L', I and I'; OIRT: D/K
- Digitally controlled (PLL) tuning via I_C-bus
- Off-air channels, S-cable channels and Hyperband
- World standardized mechanical dimensions and world standard pinning
- Compact size
- Complies to "CENELEC EN55020" and "EN55013"

PINNING	PIN VALUE
1. Gain control voltage (AGC)	4.0V, Max:4.5V
2. Tuning voltage	
PC-bus address select	Max:5.5V
PC-bus serial clock	Min:-0.3V, Max:5.5V
PC-bus serial data	Min:-0.3V, Max:5.5V
Not connected	
PLL supply voltage	5.0V, Min:4.75V, Max:5.5V
ADC input	
Tuner supply voltage	33V, Min:30V, Max:35V
10. Symmetrical IF output 1	
11. Symmetrical IF output 2	

General description of UV1336:

UV1336 series is developed for reception of channels broadcast in accordance with the M, N standard. The tuning is available through built-in digitally controlled I_C bus (PLL).

Features of UV1336:

- Global standard pinning
- Integrated Mixer-Oscillator&PLL function
- Conforms to CISPR 13, FCC and DOC (Canada) regulations
- Low power consumption
- Both Phono connector and 'F' connector are available

PINNING	PIN VALUE
1. Gain control voltage	: 4.0V, Max:4.5V
Tuning voltage	
Address select	: Max:5.5V
Serial clock	: Min.--0.3V, Max:5.5V
Serial data	: Min:-0.3V, Max:5.5V
Not connected	
Supply voltage	: 5.0V, Min:4.75V, Max:5.5V
ADC input (optional)	
Tuning supply voltage	: 33V, Min:30V, Max:35V
10. Ground	
11. IF output	

TEA6415C:

General Description:

The main function of the TEA6415C is to switch 8 video input sources on the 6 outputs.

Each output can be switched to only one of the inputs whereas but any same input may be connected to several outputs. All switching possibilities are controlled through the I_vC-bus.

Features:

20 MHz Bandwidth

Cascadable with another TEA6415C (Internal address can be changed by pin 7 voltage)

8 inputs (CVBS, RGB, Mac, CHROMA, ...)

8 Inputs (S)
6 Outputs

Possibility of MAC or chroma signal for each input by switching-off the clamp with an external resistor bridge

Possibility of Bus controlled

Bus controlled
6.5dB gain between any input and output

0.5dB gain between any
-55dB crosstalk at 5MHz

-55dB crosstalk at 3GHz
Fully ESD protected

PINNING	PIN VALUE			
1. Input	Max	2Vpp, Input Current	1mA, Max	3mA
2. Data	Low level	-0.3V Max:1.5V, High level	3.0V Max	Vcc+0.5V
3. Input	Max	2Vpp, Input Current	1mA, Max	3mA
4. Clock	Low level	-0.3V Max: 1.5V, High level	3.0V Max	Vcc+0.5V
5. Input	Max	2Vpp, Input Current	1mA, Max	3mA
6. Input	Max	2Vpp, Input Current	1mA, Max	3mA
7. Prog				
8. Input	Max	2Vpp, Input Current	1mA, Max	3mA
9. Vcc	12V			
10. Input	Max	2Vpp, Input Current	1mA, Max	3mA
11. Input	Max	2Vpp, Input Current	1mA, Max	3mA
12. Ground				
13. Output	5.5Vpp, Min	4.5Vpp		
14. Output	5.5Vpp, Min	4.5Vpp		
15. Output	5.5Vpp, Min	4.5Vpp		
16. Output	5.5Vpp, Min	4.5Vpp		
17. Output	5.5Vpp, Min	4.5Vpp		
18. Output	5.5Vpp, Min	4.5Vpp		
19. Ground				
20. Input	Max: 2Vpp, Input Current		: 1mA, Max	: 3mA

TDA9830:

General description:

The TDA9830, a monolithic integrated circuit, is **designed** for AM-sound demodulation used in L- and L'-standard. The IC provides an audio source selector and also mute switch.

Features:

- Adjustment free wideband synchronous AM demodulator
- Audio source-mute switch (low noise)
- Audio level according EN50049
- 5 to 8V power supply or 12 V **alternative**
- Low power consumption

PINNING	PIN VALUE
1. Sound IF differential input signal	; Minimum IF input signal (between pins 1 and 16):60mV Max:100mV Maximum IF input signal (between pins 1 and 16) :120mV Min :70mV
Notconnected	
AGC capacitor	
REF voltage filtering capacitor	
Not connected	
AM demodulator output	THD:0.8%, Max:2%; S/N:53dB, Min:47%; DC potential:2.15V, Min : 2.00V Max : 2.30V
Input signal (from AM) to audio switch	Max: 1.2V
Output signal from audio switch	80dB, Min : 70dB
Input signal (from external) to audio switch	Max:1.2V

10. Switch input select control	Audio switching voltage to activate pin7 : Min :0V, Max :0.8V
11. Supply voltage	Audio switching voltage to activate pin9 : Min: 1.5V, Max :Vp
12. Mute control	12V,Min:10.8V,Max:13.2V
13. Ground	For Mute-ON Min : 0V, Max: 0.8V For Mute-OFF Min : 1.5V, Max: Vp
14. Supply voltage	5V, Min: 4.5V, Max: 8.8V
15. Not connected	
16. Sound IF differential input signal	Look at pin 1

TDA2614H-DA2615/TDA2616Q:

General Description of TDA2614:

The TDA2614 is a power amplifier in a 9-lead single-in-line (SIL9) plastic medium power package. It has been especially designed for mains fed applications.

Features:

Requires very few external components
 No switch-on/switch-off clicks
Input mute during switch-on and switch-off
 Low offset voltage between output and ground
 Hi-fi in accordance with IEC 268 and DIN 45500
 Short-circuit proof and thermal protected
Mute possibility

PINNING	PIN VALUE
1. Not connected	
2. Mute input	300mA (For mute to activate)
3. Ground	
4. Not connected	
5. Supply voltage (negative)	-12VDC
6. Output	6.9Vrms
7. Supply voltage (positive)	+12VDC
8. Inverting input (Ground)	0V
9. Non-inverting input	700mVrms, Min : SOOmVrms, Max : 900mVrms

General Description of TDA2615:

The TDA2615 is a dual power amplifier in a 9-lead single-in-line (SIL9). It has been especially designed for mains fed applications.

Features:

Requires very few external components
 No switch-on/switch-off clicks
Input mute during switch-on and switch-off
 Low offset voltage between output and **ground**
 Excellent gain balance of both amplifiers
 Hi-fi in accordance with IEC 268 and DIN 45500
 Short-circuit proof and thermal protected
Mute possibility

PINNING	PIN VALUE
1. Non-inverting input 1	700mVrms, Min :500mVrms, Max : 900mVrms
2. Mute input	300mA (For mute to activate)
3. Ground	
4. Output 1	6.9Vrms
5. Supply voltage (negative)	-12VDC
6. Output 2	6.9Vrms
7. Supply voltage (positive)	+12VDC
8. Inverting inputs 1 and 2 (Ground)	0V
9. Non-inverting input 2	700mVrms, Min : 500mVrms, Max : 900mVrms

General Description of TDA2616Q:

The TDA2616Q is a dual power amplifier. It is supplied in a 9-lead SIL-bent-to DIL plastic power package (SOT157). It has been especially designed for mains fed applications.

Features:

Requires very few external components
 No switch-on/switch-off clicks
Input mute during switch-on and switch-off
 Low offset voltage between output and ground
 Excellent gain balance of both amplifiers
 Hi-fi in accordance with IEC 268 and DIN 45500
 Short-circuit proof and thermal protected
Mute possibility

PINNING

1. Non-inverting input 1
- Mute input
- Ground
- Output 1
- Supply voltage (negative)
- Output 2
- Supply voltage (positive)
- Inverting inputs 1 and 2 (Ground)
- Non-inverting input 2

PIN VALUE

700mVrms, Min : SOOmVrms, Max : 900mVrms
 300mA (For mute to activate)

9.8Vrms
 -16VDC
 9.8Vrms
 +16VDC
0V
 700mVrms, Min : SOOmVrms, **Max:** 900mVrms

TDA8351/8356:**General Description:**

The TDA8356 is a power circuit for use in 90e colour deflection system for field frequencies of 50 to 120 Hz.

The circuit operates as a highly efficient class G system.

The TDA8351 is a power circuit for use in 1100 colour deflection system for field frequencies of 50 to 120 Hz.

The circuit operates as a highly efficient class G system.

Features:

- Few external components
- Highly efficient fully **DC-coupled vertical output bridge circuit**
- Vertical flyback switch
- Guard circuit
- Protection against:
 - short-circuit of the output pins (7 and **4**)
 - short-circuit of the output pins to Vp
- Temperature (thermal) protection
- High EMC immunity because of common mode inputs
- A guard signal in zoom mode

PINNING

1. Input power-stage (positive); includes li(sb) signal bias
2. Input power-stage (negative); includes li(sb) signal bias
- Operating supply voltage
- Output voltage B
- Ground
- Input flyback supply voltage
- Output voltage A
- Guard output voltage
- Input feedback voltage

PIN VALUE

400mA, Min : 50mA, Max : 500mA
 400mA, Min : 50mA, Max : 500mA
 +15VDC
 Max : 52V Output current: 2App (TDA8356) 3App (TDA8351)

Min : Vp, Max : 50V
 Max : 52V Output current: 2App (TDA8356) 3App (TDA8351)
 Max:5.5V (Io:100mA)
 Max:52V

TDA6107Q:

The TDA6107Q includes three **video** output amplifiers in a SIL 9 MP (Single In Line 9 pins Medium Power) package SOT111BE, using high-voltage DMOS technology, and is intended to drive the three cathodes of a colour picture tube.

In contrast to previous types of DMOS video amplifiers, all external resistors (R_f, R_i and R_a) are integrated, so the gain is fixed and it saves 9 resistors.

To obtain maximum performance, the amplifier should be used with black-current control and mounted on the CRT panel.

Features:

- Bandwidth: 4.0 MHz typ at 100Vpp (Measured in application set-up, with R_{f1}=1K5 and C_i=C_{cube}+C_{pcb}=10pF)
- Slewrate: 950V/ms
- Fixed gain of 50 times
- No external components, only the well known supply decoupling
- Very simple application with a variety of colour decoders
- Black-current measurement output for automatic black current stabilization
- Only one supply voltage needed
- Internal protection against positive appearing CRT flash-over discharges
- Protection against ESD
- Internal reference voltage
- Thermal protection
- Controllable switch-off **behaviour**
- Very small PCB dimensions
- Very high replacement value

PINNING

1. Inverting input 1
2. Inverting input 2
3. Inverting input 3
4. Ground
5. BSC-output
6. Supply voltage
7. Cathode output 3
8. Cathode output 2
9. Cathode output 1

PIN VALUE

2Vpp
 2Vpp
 2Vpp
 Max:7V
 200VDC
 20mA, 100Vpp
 20mA, 100Vpp
 20mA, 100Vpp

SAA4961:

The SAA4961 is an adaptive alignment-free one chip comb filter compatible with both PAL and NTSC systems and provides high performance in Y/C separation.

Features:

- One chip adaptive multi-standard comb filter
- Time discrete but continuous amplitude signal processing with analogue interfaces
- Internal delay lines, filters, clock processing and signal switches
- Alignment-free
- No hanging dots or **residual cross colour on vertical transients**
- Few external components

It is possible to switch the comb filter into one of the following 3 modes:

1. **Comb mode** : In this mode, luminance and chrominance comb filter function **are active**. Chrominance output pin (pin 12) outputs comb filtered chrominance signal, luminance output pin (pin 14) outputs comb filtered luminance signal and CVBS output pin (pin 15) outputs delay compensated CVBS signal.
2. **Comboff mode**: In this mode, luminance comb filter function is turned off, but chrominance comb filter function operates. Chrominance output pin (pin 12) outputs comb filtered chrominance signal, luminance output pin (pin 14) outputs delay compensated CVBS signal and CVBS output pin (pin 15) outputs delay compensated CVBS signal.
3. **Bypass mode** : In this mode, no IC-function is active. Cext is bypassed to chrominance output pin (pin 12) and Yext/CVBS is bypassed to luminance output pin (pin 14) and CVBS output pin (pin 15).

PINNING	PIN VALUE
Subcarrier frequency input	200mVpp, Min : 10mVpp, Max : 400mVpp
Internal connected	
Bypass mode forcing	HIGH level input voltage Min : 2.4VDC, Max : Vcc
Internal connected	
Decoupling capacitor	1.25VDC, Min : 1.1 VDC, Max : 1.4VDC
Internal connected	
Analogue supply voltage	5VDC, Min : 4.75VDC, Max : 5.5VDC
Analogue supply voltage output buffer	5VDC, Min : 4.75VDC, Max: 5.5VDC
Analogue ground	
10. External chrominance input	0.7Vpp, Max: 1Vpp
11. Analogue ground output buffer	
12. Chrominance output signal	0mV, Min : -400mV, (DC offset voltage related to input) Max : +400mV BYPASS-mode:Co/Cext : 0dB, Min : -1dB, Max: +1dB
13. fsc reference selection	HIGH level input voltage Min : 2V, Max : Vcc Low level input voltage Min : 0V, Max: 0.8V
14. Luminance output signal	1Vpp, Min : 0.6Vpp, Max : 1.54Vpp
15. CVBS and Y output signal	1Vpp, Min : 0.6Vpp, Max: 1.54Vpp
16. Internal connected	
17. CVBS and Y input signal	1Vpp, Min : 0.7Vpp, Max : 1.4Vpp
18. Disable prefilter	HIGH level input voltage Min : 2.0VDC, Max : Vcc LOW level input voltage Min : OVDC, Max : 0.8VDC
19. Storage Capacitor	2.5VDC, Min : 1.8VDC, Max : Vcc
20. Standard select 1	HIGH level input voltage Min : 2.0VDC, Max : Vcc LOW level input voltage Min : OVDC, Max : 0.8VDC
21. Digital ground	
22. Digital supply voltage	5VDC, Min : 4.75VDC, Max : 5.5VDC
23. Standard select 2	HIGH level input voltage Min : 2.0VDC, Max : Vcc LOW level input voltage Min : OVDC, Max : 0.8VDC
24. Decoupling capacitor	1.25VDC, Min : 1.1 VDC, Max: 1.4VDC
25. Controlling I/O pin	HIGH level input voltage Min : 2.4VDC, Max : Vcc LOW level input voltage Min : OVDC, Max : 1.5VDC
26. Analogue ground PLL	
27. Analogue supply voltage PLL	5VDC, Min : 4.75VDC, Max : 5.5VDC
28. Internal connected	

MC44604:

General description:

The MC44604 is an enhanced high performance controller that is specifically designed for off-line and DC-to-DC converter applications. It offers a really safe and reliable power management thanks particularly to its protection features (foldback, overvoltage detection, soft start, accurate demagnetization detection). Its high current totem pole output is also ideally suited for driving a power MOSFET, but can also be used for driving a bipolar transistor in low power converters. In addition to these features, the MC44604 offers an efficient stand-by mode.

Features:

Current Mode Controller

- Operation up to 250 kHz Output Switching Frequency
- Inherent Feed Forward Compensation
- Latching PWM for Cycle-by-Cycle Current Limiting
- Oscillator with Precise Frequency Control
- **High Flexibility**
 - Externally Programmable Reference Current
 - Secondary or Primary Sensing
 - High Current Totem Pole Output
 - Undervoltage Lockout with Hysteresis

Safety/Protection Features

- Overvoltage Protection Facility against Open Loop
- Protection against Short Circuit on Oscillator Pin
- Fully Programmable Foldback
- Soft-Start Feature
- Accurate max Duty Cycle Setting
- Demagnetization (Zero Current **Detection**) Protection
- Internally Trimmed Reference

Green Controller"

- Low Start-Up and Operating Current
- Patented Stand-by Pulsed Mode for low stand-by losses
- Low dV/dT for Low EMI radiations

PINNING

	PIN VALUE
1. Output Supply Voltage (Vcc)	12VDC
2. Output Supply Voltage (Vc)	12VDC
3. Output voltage	LOW Level Drop Voltage 1VDC, Max 1.2VDC (Isink=100mA) 1.4VDC, Max 2VDC (Isink=500mA)
	HIGH Level Drop Voltage 1.5VDC, Max 2VDC (Isource=200mA) 2VDC, Max 2.7VDC (Isource=500mA)
4. Ground	0.9VDC, Min:-0.3VDC, Max : Vcc+0.3VDC
5. Foldback input	0.78VDC, Min:-0.3VDC, Max : Vcc+0.3VDC
6. Overvoltage protection (OVP)	Min:-0.3VDC, Max: Vcc+0.3VDC
7. Current sense input	Idemag-ib (source):-4mA Idemag-ib (sink): 10mA
8. Demagnetization detection input	Ipeak-stby/Iref: 0.40 Min : 0.37 Max : 0.43
9. Standby current set	2Vpp
10. Oscillator voltage swing	[discharge : 5mA, Min : 1.5mA (Vsoft starts! V) 4.7VDC, Min : 4.5VDC Max : 4.9VDC
11. Softstart/Dmax/Voltage mode	HIGH State: 6.5VDC, Min : 5.5VDC, Max : 7.5VDC LOW State : 1.0VDC, 1.1VDC
12. Clamp E/A input	2.5VDC, Min : 2.4VDC, Max : 2.6VDC
13. E/A output	Stand-by On Detection current ratio : Idet/Iref: 0.38, Min : 0.34, Max : 0.42
14. E/A input	Stand-by regulation current ratio : Ireg/Iref: 20.5, Min : 18, Max : 23
15. Stand-by management	2.5VDC, Min : 2.4VDC, Max : 2.6VDC
16. Rref input	

SDA525X:

General description:

The SDA525X is designed for a low cost, mono TV-set with analogue picture and **sound** control. IN SDA525X the following 1C's are used and supported:

Non-volatile memory	SDA 2526 or SDA2546
PLL	SDA 3202-3, SDA 3302
IR transmitter	SDA 2208-3 or SDA 2218
IR preamplifier	SFH 506-32

Features:

General:

- Display of program number, channel number, TV standard, analogue values, sleep timer, parental control, and mute is done **by** OSD
- Single LED for IR active, standby and on mode indication
- Local control (8 keys)
- IR remote control
- Control of volume, contrast, brightness, and saturation by analogue voltages
- Non-volatile memory for 50 or 100 programs, optimum analogue values and system parameters
- Individual delta volume for each program
- 1 control line to select external source
- 3 control lines for TV standard selection
- Automatic muting if no carrier detected
- Automatic switch-off when carrier disappears for more than 5 minutes
- Software protection against tube flashovers with internal watchdog timer
- Sleep timer
- Parental control
- IF 38 MHz or 38.9 MHz selectable

using:

- Frequency synthesis tuning (62.5 kHz steps)
- 192 step fine tuning
- Channels corresponding to standards
- 100 programs selectable by directly entering a program number or by up/down function depending on the NVM size
- Channel selection by directly entering a channel number or by up/down function
- Channel search function in two directions

Sound:

- Mono sound control by analogue voltage

Service Mode:

- System configuration with service mode

PINNING

	PIN VALUE
1. Crystal selection output 1	: LOW level 0V HIGH level 4.2V
2. Volume + switch input	: LOW level 0V HIGH level 5V
3. Volume - switch input	: LOW level 0V HIGH level 5V
4. Program - switch input	: LOW level 0V HIGH level 5V
5. Program + switch input	: LOW level 0V HIGH level 5V
6. LED output	: LOW level 0V HIGH level 4.2VDC
7. Filter (sound standard) selection output 1	• LOW level 0V HIGH level 4.2V
8. Filter (sound standard) selection output 2	• LOW level 0V HIGH level 4.2V
9. Mod-switch selection output	LOW level 0V HIGH level 4.2V
10. Ground	
11. Supply voltage	+5V
12. 1.8 MHz crystal connection 1	2Vpp
13. 1.8 MHz crystal connection 2	2Vpp
14. L-ACC output	LOW level 0V HIGH level 3.6V
15. RESET output	LOW level 0V HIGH level 5V
16. Comb filter PAL/SECAM selection output	LOW level 0V HIGH level 5V
17. Tuning output	: LOW level 0V HIGH level 3.4V
18. Audio switch transistor selection 1	: LOW level 0V HIGH level 5V
19. Audio switch transistor selection 2	LOW level 0V HIGH level 5V
20. Audio switch transistor selection 3	LOW level 0V HIGH level 5V
21. Audio switch transistor selection 4	LOW level 0V HIGH level 5V
22. Comb filter standard selection 1	: LOW level 0V HIGH level 5V
23. Comb filter standard selection 2	: LOW level 0V HIGH level 5V
24. Analogue ground	
25. Filter 3	
26. Filter 2	
27. Filter 1	
28. Analogue supply voltage	5VDC
29. Reference current input	
30. CVBS input	1Vpp
31. Service output	LOW level 0V HIGH level 5V
32. AV2-status input	LOW level 0V HIGH level 5V
33. AV1-status input	LOW level 0V HIGH level 5V
34. AFC output	600mVpp
35. Ground	
36. IR-input	LOW level 0V HIGH level 5V
37. Supply voltage	5V
38. LC input	5Vpp
39. LC output	5Vpp
40. Mute output	LOW level 0V HIGH level 4.2V
41. St-by output	LOW level 0V HIGH level 1.4V
42. Clock signal output	
43. Data output	
44. Local connection	LOW 0V HIGH 5V
45. SAND input	4Vpp
46. ODD/EVEN output	1.8V
47. OSD-red output	LOW level 0V HIGH level 5V
48. OSD-green output	LOW level 0V HIGH level 5V
49. OSD-blue output	LOW level 0V HIGH level 5V
50. OSD-blanking output	LOW level 0Vh HIGH level 5V
51.COR output	LOW level 0V HIGH level 5V
52. Crystal selection output 2	LOW level 0V HIGH level 4.2V

TDA9875:

General description:

The TDA9875 is a single-chip Digital TV Sound Processor (DTVSP) for analogue and digital multi-channel sound systems.

Features:

Demodulator and decoder section:

- Sound IF (SIF) input switch e.g. to select between terrestrial TV SIF and SAT SIF sources
- SIF AGC with 21 dB control range
- SIF 8-bit Analogue-to-Digital Converter (ADC)
- DQPSK demodulation for different standards, simultaneously with 1-channel FM demodulation
- NICAM decoding (B/G, I and L standard)
- Two-carrier multistandard FM demodulation (B/G, D/K and M standard)
- Decoding for three analogue multi-channel systems (A2, A2+ and A2*) and satellite sound
- Optional AM demodulation for system L, simultaneously with NICAM
- Programmable identification (B/G, D/K and M standard) and **different identification times**

DSP section:

- Digital crossbar switch for all digital signal sources and destinations
- Control of volume, balance, contour, bass, treble, pseudo stereo, spatial, bass boost and soft-mute
- Plop-free volume control
- Automatic Volume Level (AVL) **control**
- Adaptive de-emphasis for satellite
- Programmable beeper
- Monitor selection for FM/AM DC values and signals, with peak detection option
- PS-bus interface for a feature extension (e.g. Dolby surround) with matrix, level adjust and mute.

Analogue audio section:

- Analogue crossbar switch with inputs for mono and stereo, SCART 1 input/output, SCART2 input/output and line output
- User defined full-level/-3dB scaling for SCART outputs
- Output selection of mono, stereo, dual A/B, dual A or dual B
- 20 kHz bandwith for SCART-to-SCART copies
- Standby mode with functionality for SCART copies
- Dual audio digital-to-analogue converter from DSP to analogue crossbar switch, bandwith 15kHz
- Dual audio ADC from analogue inputs to DSP
- Two dual audio Digital-to-Analogue Converters (DACs) for loudspeakers (Main) and headphone (Auxiliary) outputs; also applicable for L, R, C and S in the Dolby Pro Logic mode with feature extension.

PINNING

	PIN VALUE
1. NICAM clock output (728kHz)	LOW level input voltage Max 0.8V HIGH level input voltage Min 2.0V
2. Serial NICAM DATA output (728kHz)	LOW level input voltage Max 0.8V HIGH level input voltage Min 2.0V
3. First PC-bus slave address modifier	LOW level input voltage Max 0.8V HIGH level input voltage Min 2.0V
4. SCL (PC-bus clock)	LOW level input voltage Max 1.6V HIGH level input voltage Min 3.0V
5. SDA (PC-bus data)	LOW level input voltage Max 0.8V HIGH level input voltage Min 2.0V
6. Analogue supply ground 1	0V
7. Analogue supply voltage 1	5V, Min : 4.75V, Max : 5.5V
8. Resistor for reference current generator	Iref: 220mA, Min : 170mA, Max : 260mA
9. First general purpose I/O pin	
10. Sound IF input 2	Min : 21Vrms, Max : 250mVrms
11. Reference voltage for demodulator part	Vdda1/Vssa1 : 50%, Min : 35%, Max : 65%
12. Sound IF input 1	Min : 21Vrms, Max : 250mVrms
13. Second PC-bus slave address modifier	LOW level input voltage : Max : 0.8V HIGH level input voltage : Min : 2.0V
14. Digital supply ground 1	0V
15. Digital supply voltage 1	5V, Min : 4.75V, Max : 5.5V
16. Capacitor for power-on reset	LOW level input voltage : Max : 1.6V HIGH level input voltage : Min : 3.0V
17. Crystal oscillator output	
18. Crystal oscillator input	
19. Tuning voltage output for crystal oscillator	
20. Second general purpose I/O pin	
21. System clock output	LOW level input voltage Max 0.5V HIGH level input voltage Min 2.9V
22. PS-bus clock	LOW level input voltage Max 0.8V HIGH level input voltage Min 2.0V
23. PS-bus word select	LOW level input voltage Max 0.8V HIGH level input voltage Min 2.0V
24. PS-bus data output 2	LOW level input voltage Max 0.8V HIGH level input voltage Min 2.0V
25. PS-bus data output 1	LOW level input voltage Max 0.8V HIGH level input voltage Min 2.0V
26. PS-bus data input 2	LOW level input voltage Max 0.8V HIGH level input voltage Min 2.0V
27. PS-bus data input 1	LOW level input voltage Max 0.8V HIGH level input voltage Min 2.0V
28. First test pin; connected to ground for normal operation	500mVrms
29. Audio mono input	350mVrms
30. Second test pin; connected to ground for normal operation	
31. External audio input right channel	

32. External audio input left channel	350mVrms
33. SCART 1 input right channel	350mVrms
34. SCART 1 input left channel	350mVrms
35. Ground guards	
36. SCART 2 input right channel	350mVrms
37. SCART 2 input left channel	350mVrms
38. Analogue supply voltage 2	5V, Min : 4.75V, Max : 5.5V
39. Positive reference voltage	
40. Reference voltage ground	0V
41. Filter capacitor pin 1	
42. Filter capacitor pin 2	
43. Analogue supply ground 2	0V
44. Filter capacitor pin 2	
45. Filter capacitor pin 1	
46. Reference voltage 2	Vdda2/Vssa2 : 50%
47. Scan 1 output right channel	500mVrms
48. Scart 1 output left channel	500mVrms
49. Digital supply ground 2	0V
50. Analogue supply ground 4	0V
51. Scart 2 output right channel	500mVrms
52. Scart 2 output left channel	500mVrms
53. Reference voltage 3	Vdda3/Vssa3:50%
54. Post-filter capacitor pin right channel	
55. Post-filter capacitor pin left channel	
56. Analogue supply ground 3	0V
57. Headphone output right channel	Vo(clip): Min : 1400mVrms
58. Headphone output left channel	Vo(clip) : Min : 1400mVrms
59. Analogue supply voltage 3	5.0V, Min : 4.75V, Max : 5.5V
60. Loudspeaker (main) output right channel	Vo(clip) : Min : 1400mVrms
61. Loudspeaker (main) output left channel	Vo(clip): Min : 1400mVrms
62. Line output left channel	500mVrms
63. Line output right channel	500mVrms
64. Digital supply voltage 2	5.0V, Min : 4.75V, Max: 5.5V

TDA9818:

General description:

The TDA9818 is an integrated circuit for multistandard vision IF signal processing, sound AM and FM demodulation.

Features:

- 5 V supply voltage
- Applicable for IF frequencies of 38.9 MHz, 45.75 MHz and 58.75 MHz
- Gain controlled wide band VIF-amplifier (AC-coupled)
- True synchronous demodulation with active carrier regeneration (very linear demodulation, good intermodulation figures, reduced harmonics, excellent pulse response)
- Robustness for over modulation better than 105% due to gated phase detector at L/L accent standard and PLL-bandwidth control at negative modulated standards
- VCO frequency switchable between L and L accent (alignment external) picture carrier frequency
- VIF AGC detector for gain control, operating as peak sync detector for B/G, peak white detector for L; signal controlled reaction time for L
- Tuner AGC with adjustable takeover point (TOP)
- AFC detector without extra reference circuit
- AC-coupled limiter amplifier for sound intercarrier signal
- Alignment-free **FM-PLL demodulator with high linearity**
- SIF input for single reference QSS mode (PLL controlled); SIF AGC detector for gain controlled SIP amplifier; single reference QSS mixer able to operate in high performance single reference QSS mode and in intercarrier mode
- AM demodulator without extra reference circuit
- Stabilizer circuit for ripple rejection and to achieve constant output signals
- ESD protection for all pins

PINNING

1. VIF differential input signal voltage 1	Input signal voltage sensitivity 60mVrms, Max:100mVrms
2. VIP differential input signal voltage 2	Input signal voltage sensitivity 60mVrms, Max:100mVrms
3. Standard switch	Min : 2.8V, Max : Vp
4. VIF AGC capacitor	Charging current: 1 mA, Min : 0.75mA, Max : 1.25mA Discharging current: B/G standard : 20mA, Min : 15mA, Max:25mA Normal mode L : 300nA, Min : 225nA, Max : 375nA Fast mode L : 40mA, Min : 30mA, Max : 50mA
5. SIP AQC capacitor	Charging current: FM mode : 12mA, Min : 8mA, Max : 16mA AM mode : 1.2mA, Min : 0.8mA, Max : 1.6mA Discharging current: FM mode : 12mA, Min : 8mA, Max: 16mA Normal mode AM : 1.4mA, Min : 1mA, Max : 1.8mA Fast mode AM : 85mA, Min : 60mA, Max: 110mA Min:0V, Max:Vp
PLL loop filter	Min:0V, Max:Vp
L/L accent switch and adjust	Min:0V, Max:Vp
Audio output	Rx : 470ohm : 250mVrms, Min : 200mVrms, Max : 300mVrms Rx: 0ohm : 500mVrms, Min : 400mVrms, Max : 600mVrms
9. De-emphasis input	Min:0V, Max:Vp
10. De-emphasis output	Min:0V, Max:Vp
11. Decoupling capacitor	Min:0V, Max:Vp
12. Single reference QSS/intel-can-ier output voltage	140mVrms, Min : 100mVrms Max : 180mVrms

13. Sound intercarrier input voltage	Input signal voltage for lock-in: Max : IOOmVrms
14. Tuner AGC output	Input signal voltage : 250mVnns
15. Black level detector	IF input signal voltage for minimum starting point of tuner takeover 2mV, Max: 5mV
16. Composite video output voltage	IF input signal voltage for maximum starting point of tuner takeover 100mV, Min:50mV
17. AFC output	Min : 0V, Max : Vp
18. VC01 resonance circuit	1.1Vpp, Min:0.97Vpp, Max : 1.23Vpp
19. VC02 resonance circuit	Upper limit: Vp-0.3V, Min : Vp-0.6V, Lower limit: 0.3V, Max : 0.6V
20. Ground	0V
21. Supply voltage	5V, Min : 4.5V, Max : 5.5V
22. Tuner AGC takeover adjust (TOP)	Input signal voltage sensitivity SOmVrms, Max : 100mVrms
23. SIF differential input signal voltage 1	Input signal voltage sensitivity 50mVrms, Max: IOOmVrms
24. SIF differential input signal voltage 2	

ST24C08:

General description:

The ST24C08 is a 8Kbit electrically erasable programmable memory (EEPROM), organized as 4 blocks of 256 ' 8 bits. The memory operates with a power supply value as low as 2.5V. Both Plastic Dual-in-Line and Plastic Small Outline packages are available.

Features:

- Minimum 1 million ERASE/WRITE cycles with over 10 years data retention
- Single supply voltage:4.5 to 5.5V
- Two wire serial interface, fully I_C-bus compatible
- Byte and Multibyte write (up to 8 bytes)
- Page write (up to 16 bytes)
- Byte, random and sequential read modes
- Self timed programming cycle

PINNING

	PIN VALUE
1. Write protect enable (Ground)	0V
2. Not connected (Ground)	0V
3. Chip enable input (Ground)	0V
4. Ground	0V
5. Serial data address input/output	Input LOW voltage : Min : -0.3V, Max : 0.3*Vcc Input HIGH voltage: Min : 0.7*Vcc, Max : Vcc+1
6. Serial clock	Input LOW voltage : Min: -0.3V, Max: 0.3*Vcc Input HIGH voltage: Min : 0.7*Vcc, Max : Vcc+1
7. Multibyte/Page write mode	Input LOW voltage : Min: -0.3V, Max : 0.5V Input HIGH voltage: Min : Vcc-0.5, Max : Vcc+1
8. Supply voltage	Min : 2.5V, Max : 5.5V

TDA1308:

Features:

- Wide temperature range
- No switch ON/OFF clicks
- Excellent power supply ripple rejection
- Low power consumption
- Short-circuit **resistant**
- High performance
- high signal-to-noise ratio
- high **slew rate**
- low distortion
- Large output voltage swing

PINNING

	PIN VALUE
Output A (Voltage swing)	Min : 0.75V, Max : 4.25V
Inverting input A	Vo(clip): Min : 1400mVrms
Non-inverting input A	2.5V
Ground	0V
Non-inverting input B	2.5V
Inverting input B	Vo(clip): Min : 1400mVrms
Output B (Voltage swing)	Min : 0.75V, Max : 4.25V
Positive supply	
:	5V, Min : 3.0V, Max : 7.0V

G1965M:

Features:

- TV IF filter with Nyquist slope and sound shelf at typ. 20.4dB
- High colour carrier level at typ. 1.0dB
- Constant group delay
- Insertionattenuationtyp.15.0dB

PINNING

1. Input
2. Input-ground
3. Chip carrier-ground

TDA9855

General description:

The TDA9855 is a bipolar-integrated BTSC stereo/SAP decoder with hi-fi audio processor (I₂C-bus controlled) for application in TV sets.

Features:

- Quasi alignment-free BTSC stereo decoder due to auto adjustment of channel separation via I₂C-bus
- High integration level with automatically tuned integrated filters
- Input level adjustment I₂C-bus controlled
- Alignment-free Sap processing
- dbx noise reduction **circuit**
- Audio processor
 - Selector for internal and external signals (line in)
 - Automatic volume level control
 - Subwoofer or surround output with separate volume control
 - Volume control
 - Special loudness characteristic automatically controlled in combination with volume setting
 - Bass and treble control
 - Audio signal zero crossing detection between any volume step switching
 - Mute control at audio signal zero crossing
 - I₂C-bus transceiver.

PINNING

1. Treble control capacitor, left **channel**

Bass control capacitor, left channel
Bass control capacitor, left channel
Not connected

Programmable address bit (module address)
Output, left channel

PIN VALUE

500mVrms, Min : 480mVrms,
Max: 520mVrms

7. Input loudness, left channel

2.15Vrms, Min: 2Vrms

8. Input volume control, left channel

4VDC
2.3Vrms, Min: **2Vrms**
Min : 2Vrms

9. Output effects, left channel

500mVrms

10. Automatic volume control **capacitor**

11. Reference voltage 0.5Vcc

4VDC

12. Line input, left channel

2.3Vrms, Min: **2Vrms**

13. Input automatic volume control, left channel

Min : 2Vrms

14. Output selector, left channel

15. Line output, left channel

16. Capacitor timing wideband for **dbx**

17. Capacitor timing spectral for dbx

18. Capacitor wideband for dbx

19. Capacitor spectral for dbx

20. Variable emphasis out for dbx

21. Variable emphasis in for dbx

22. Capacitor noise reduction for **dbx**

23. Capacitor mute for SAP

24. Capacitor DC decoupling for SAP

25. Common ground

26. Serial data input/output

27. Serial clock input

0V

High level input voltage:

Min : 3VDC, Max : Vcc Low level input voltage:

Min:-0.3VDC,Max:1.5VDC

Low level output voltage : Max : 0.4VDC

High level input voltage:

Min : 3VDC, Max : Vcc

Low level input voltage : Min : -0.3VDC, Max : 1.5VDC

Low level output voltage: Max: 0.4VDC

8VDC

250mVrms

28. Supply voltage

29. Input composite signal

30. Capacitor for electronic filtering of supply

31. Capacitor for pilot detector

32. Capacitor for pilot detector

33. Capacitor for phase detector

34. Capacitor for filter adjust

35. Ceramic resonator

36. Capacitor DC decoupling mono

37. Capacitor DC decoupling **stereo/SAP**

38. Line output, right channel

500mVrms

39. Output selector, right channel

Min:2Vrms

40. Input automatic volume control, right channel

2.3Vrms, Min: 2Vrms

41. Line input, right channel

42. Capacitor 2 pseudo function

43. Capacitor 1 pseudo function

44. Output effects, right channel

Min: 2Vrms

45. Input volume control, right channel

500mVrms, Min : 480mVrms,

46. Input loudness, right channel

Max : 520mVrms

47. Output, right channel

48. Not connected

49. Filter capacitor for subwoofer

50. Bass control capacitor, right channel

51. Bass control capacitor, right channel

52. Treble control capacitor

AK19 CHASSIS MANUAL ADJUSTMENTS PROCEDURE

In order to enter the service menu, first enter the installation menu and then press the digits 4, 7, 2 and 5 respectively.

For ADJUST settings:

Select Adjust using VorA button and press Oor<^> button to enter it. To select different adjust parameters, use V^A button. To change the selected parameter, use [> or <] button.

WHITE BALANCE ADJUSTMENT:

The following three parameters are used to make white balance adjustment. To do this, use a Colour Analyser. Using white point RED, white point GREEN and white point BLUE parameters, insert the + sign in the square which is in the middle of the screen.

ADJUST 00 = White Point RED

ADJUST 01 = White Point GREEN

ADJUST 02 = White Point BLUE

AGC ADJUSTMENT:

In order to do AGC adjustment, enter a BOdBmV RF signal level from channel C-12.

Connect a digital voltmeter to pin 1 of the tuner. Change the AGC parameter until you see 3.70VDC on voltmeter display. Check that picture is normal at 90dBmV signal level.

ADJUST 03 = AGC

IF-PLL NEGATIVE ADJUSTMENT (Only with PLL tuner):

Connect 38.9 MHz test pattern for PAL B/G, PAL-SECAM B/G, 39.5 MHz test pattern for PAL I or 45.75 MHz test pattern for PAL MN, NTSC M model to Z401 SAW filter input terminals. Change the IF-PLL Negative parameter until you see IN, DOWN below. If you cannot catch IN, DOWN position this way, using a screwdriver rotate the VIF-COIL LT401 left or right until you see IN, DOWN.

ADJUST 04 = IF-PLL Negative

IF-PLL POSITIVE ADJUSTMENT (Only with PLL tuner):

Connect 33.9 MHz test pattern for SECAM L' model to Z401 SAW filter input terminals. Change the IF-PLL Positive parameter until you see IN, DOWN below. If you cannot catch IN, DOWN position this way, using a screwdriver rotate the VIF-COIL LT401 left or right until you see IN, DOWN.

ADJUST 05 = IF-PLL Positive

LUMINANCE DELAY ADJUSTMENT (with only TDA 8844 video processor):

ADJUST 06 = Y-Delay PAL

Enter a PAL B/G colour and black-white bar test pattern via RF. Adjust Y-Delay PAL till the colour transients on the colour bar of the pattern become as sharper and colours between transients do not mix with each other as possible.

Note: If the SAW filter is one of the G1965M, J1951M, J3950M, K2958M, K2962M, G3957M, K6256K, K6259K or M1963M, there is constant group delay distortion, so for an equal delay of the luminance and chrominance signal the delay must be set at a value of 160nS. **This means the adjustment must be set to the maximum value.**

ADJUST 07 = Y-Delay SECAM

Enter a SECAM B/G colour and black-white bar test pattern via RF. Adjust Y-Delay SECAM till the colour transients on the colour bar of the pattern become as sharper and colours between transients do not mix with each other as possible.

Note: If the SAW filter is one of the G1965M, K2958M, K2962M, G3957M, K6256K or K6259K, there is constant group delay distortion, so (or an equal delay of the luminance and chrominance signal the delay must be set at a value of 160nS. This means the adjustment must be set to the maximum value.

This means the adjustment must be set to the maximum value.

ADJUST 08 = Y-Delay NTSC

Enter an NTSC colour and black-white bar test pattern via RF. Adjust Y-Delay NTSC till the colour transients on the colour bar of the pattern become as sharper and colours between transients do not mix with each other as possible.

Note: If the SAW filter is M1963M, there is constant group delay distortion, so for an equal delay of the luminance and chrominance signal the delay must be set at a value of 160nS. This means the adjustment must be set to the maximum value.

ADJUST 09 = Y-Delay Other

In case of other colour systems, enter this system with colour and black-white bar test pattern via RF. Adjust Y-Delay Other till the colour transients on the colour bar of the pattern become as sharper and colours between transients do not mix with each other as possible. Normally for an equal delay of the luminance and chrominance signal the delay must be set at a value of 160nS. This means the adjustment must be set to the maximum value.

VERTICAL ZOOM ADJUSTMENT (only for 1100 picture tubes):

ADJUST 10 = Vertical Zoom

Enter a PAL B/G circle test pattern via RF. Change vertical zoom till you see the upper and lower limit of the circle as close to the upper and lower limit of the picture tube **as** possible.

VERTICAL SCROLLADJUSTMENT(onlyfor110epicturetubes):

ADJUST 11 = Vertical Scroll

Enter a PAL B/G circle test pattern via RF. Change vertical scroll till you see the circle exactly in the middle of the screen.

4:3 HORIZONTAL SHIFT ADJUSTMENT:

ADJUST 12 = 4 : 3 Horizontal Shift

Enter a RED PURITY test pattern via RF. Change horizontal shift till the picture is horizontally centred. Check whether this adjustment is correct after completing Service Mode Adjustment.

4:3 VERTICAL SLOPE ADJUSTMENT:

ADJUST 13 = 4 : 3 Vertical Slope

Enter a CROSS-HATCH B/G test pattern via RF. Change vertical slope till the size of squares on both the upper and lower part of test pattern become equal to the squares laying on the vertical centre of the test pattern. Check and readjust VERTICAL SLOPE item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 VERTICAL AMPLITUDE ADJUSTMENT:**ADJUST 14 = 4 : 3 Vertical Amplitude**

Enter a PAL B/G test pattern via RF. Change vertical slope till horizontal black lines on both the upper and lower part of the test pattern become very close to the upper and lower horizontal sides of picture tube and nearly about to disappear. Check and readjust VERTICAL AMPLITUDE item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 S-CORRECTION ADJUSTMENT:**ADJUST 15 = 4 : 3 S-Correction**

Enter a PAL B/G circle test pattern via RF. Change S-correction till the middle part of the circle is as round as possible.

4:3 VERTICAL SHIFT ADJUSTMENT:**ADJUST 16 = 4 : 3 Vertical Shift**

Enter a PAL B/G test pattern via RF. Change Vertical Shift till the test pattern is vertically centred, i.e. horizontal line at the centre pattern is in equal distance both to upper and lower side of the picture tube. Check and readjust Vertical Shift item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 EW WIDTH ADJUSTMENT (only for 1100 picture tubes):**ADJUST 17 = 4 : 3 EW Width**

Enter a PAL B/G test pattern via RF. Change EW Width till the vertical black and white bars on both left and right side of the pattern exactly disappear.

4:3 EW PARABOLA WIDTH ADJUSTMENT (only for 1100 picture tubes):**ADJUST 18 = 4 : 3 EW Parabola Width**

Enter a PAL B/G test pattern via RF. Change EW Parabola Width till vertical lines close to the both sides of the picture frame become parallel to vertical sides of picture tube. Check and readjust EW Parabola Width item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 EW CORNER PARABOLA ADJUSTMENT (only for 1100 picture tubes):**ADJUST 19 = 4 : 3 EW Corner Parabola**

Enter a PAL B/G test pattern via RF. Change EW Corner Parabola till vertical lines at the corners of both sides of picture frame become vertical and parallel to vertical corner sides of picture tube. Check and readjust EW Corner Parabola item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 EW TRAPEZIUM ADJUSTMENT (only for 1100 picture tubes):**ADJUST 20 = 4 : 3 EW Trapezium**

Enter a PAL B/G test pattern via RF. Change EW Trapezium till vertical lines, especially lines at the sides of the picture frame became parallel to the both sides of picture tube as close as possible. Check and readjust EW Trapezium item if the adjustment becomes improper after some other geometric adjustments are done.

16:9 HORIZONTAL SHIFT ADJUSTMENT:**ADJUST 21 = 16 : 9 Horizontal Shift**

Enter a RED PURITY test pattern via RF. Change horizontal shift till the picture is horizontally centred. Check whether this adjustment is correct after completing Service Mode Adjustment.

16:9 VERTICAL SLOPE ADJUSTMENT:**ADJUST 22 = 16 : 9 Vertical Slope**

Enter a CROSS-HATCH B/G test pattern via RF. Change vertical slope till the size of squares on both the upper and lower part of test pattern become equal to the squares laying on the vertical centre of the test pattern. Check and readjust VERTICAL SLOPE item if the adjustment becomes improper after some other geometric adjustments are done.

16:9 VERTICAL AMPLITUDE ADJUSTMENT:**ADJUST 23 = 16 : 9 Vertical Amplitude**

Enter a PAL B/G test pattern via RF. Change vertical slope till horizontal black lines on both the upper and lower part of the test pattern become very close to the upper and lower horizontal sides of picture tube and nearly about to disappear. Check and readjust VERTICAL AMPLITUDE item if the adjustment becomes improper after some other geometric adjustments are done.

16:9 S-CORRECTION ADJUSTMENT:**ADJUST 24 = 16 : 9 S-Correction**

Enter a PAL B/G circle test pattern via RF. Change S-correction till the middle part of the circle is as round as possible.

16:9 VERTICAL SHIFT ADJUSTMENT:**ADJUST 25 = 16 : 9 Vertical Shift**

Enter a PAL B/G test pattern via RF. Change Vertical Shift till the test pattern is vertically centred, i.e. horizontal line at the centre pattern is in equal distance both to upper and lower side of the picture tube. Check and readjust Vertical Shift item if the adjustment becomes improper after some other geometric adjustments are done.

16:9 EW WIDTH ADJUSTMENT (only for 1100 picture tubes):**ADJUST 26 = 16 : 9 EW Width**

Enter a PAL B/G test pattern via RF. Change EW Width till the vertical black and white bars on both left and right side of the pattern exactly disappear.

16:9 EW PARABOLA WIDTH ADJUSTMENT (only for 1100 picture tubes):**ADJUST 27 = 16 : 9 EW Parabola Width**

Enter a PAL B/G test pattern via RF. Change EW Parabola Width till vertical lines close to the both sides of the picture frame become parallel to vertical sides of picture tube. Check and readjust EW Parabola Width item if the adjustment becomes improper after some other geometric adjustments are done.

16:9 EW CORNER PARABOLA ADJUSTMENT (only for 1100 picture tubes):

ADJUST 28 = 16 : 9 EW Corner Parabola

Enter a PAL B/G test pattern via RF. Change EW Comer Parabola till vertical lines at the comers of both sides of picture frame become vertical and parallel to vertical corner sides of picture tube. Check and readjust EW Comer Parabola item if the adjustment becomes improper after some other geometric adjustments are done.

16:9 EW TRAPEZIUM ADJUSTMENT (only for 1100 picture tubes):

ADJUST 29 = 16 : 9 EW Trapezium

Enter a PAL B/G test pattern via RF. Change EW Trapezium till vertical lines, especially lines at the sides of the picture frame became parallel to the both sides of picture tube as close as possible. Check and readjust EW Trapezium item if the adjustment becomes improper after some other geometric adjustments are done.

For OPTION settings:

Select **OPTION** using V or A button and press > or < button to enter H. To select different **option bytes**, use V or A button. Using [> or <] button select the bit you want to set and then set it pressing 0 or 1 button.

OPTION 00

B7B6B5B4B3B2B1BO

B7 = Ina **X (Note 1) (don't care)**
B6 = Inb **X (Note 1) (don't care)**
B5 = Inc **XX (Note 1) (don't care)**
B4 = Akb 0 (Auto Kine Biasing, 1=disable **black current stabilisation** loop, 0=enable)
B3 = Foa **X (Note 2) (don't care)**
B2 = Fob **X (Note 2) (don't care)**
B1 = Xa **Note 3**
BO = Xb **Note 3**

Note 1:

Ina, Inb, Inc bits: Input Source Select Switch. This determines which signal is displayed and which is available at CVBSout pin 38. This output can be connected to teletext, the TDA8395 SECAM add-on or a comb filter. There are two special positions, where the output of pin 38 can be fed through the comb filter, back into the Y and C input pins Hand 10.

INA	INB	INC	Selected Video Source	Selected Audio	CVBS switch ouput (Pin 38)
0	0	0	CVBSint pin 13	Internal (Note a)	CVBSint
0	0	1	CVBS2ext pin 17	External pin 2	CVBS2ext
0	1	0	Ys-vhs, Cs-vhs pins 11, 10	External pin 2	Y and C added to CVBS
0	1	1	CVBS3ext pin 11	External pin 2	CVBS3ext
1	0	0	Ys-vhs, Cs-vhs pins 11, 10	Internal (Note a)	CVBSint
1	1	0	Ys-vhs, Cs-vhs pins 11, 10	External pin 2	CVBS2ext

Note a:

Positive Modulation (MOD=1) selects pin 2 for (AM demodulated) sound input.

Note 2:

FOA, FOB bits: 01 time constant: These two bits determine the speed of the 01-loop. It can be forced to slow and fast or set it in the automatic mode. In auto mode a noise detector circuit can switch to slow time constant, when the signal has too much noise.

FOA	FOB	01 -loop mode
0	0	Auto, 01-gating in slow mode (Note b)
0	1	Slow, always gating
1	0	Slow/fast depends on noise detector, always gating
1	1	Fast, no gating

Note b:

Not suitable for weak video recorder signals, because of active 01-gating in the slow mode. Use **FOA, FOB=1,1** instead.

Note 3:

Xa,Xb

0,1 : PAL M, Pal N, NTSC M

Pin 34 : 3.58 (1, 2 or 3 crystals)

Pin 35 : **No crystal**

1.0 : PAL B/G, PAL D/K, Pal I/I+, SECAM B/G, SECAM D/K, SECAM L/L', SECAM K1

Pin 34 : No crystal

Pin 35 : 4.43 (1 Crystal)

1.1 : PAL B/G, PAL D/K, Pal I/I+, SECAM B/G, SECAM D/K, SECAM L/L', SECAM K1, PAL M, PAL N, NTSC M

Pin 34 : 3.58 (1, 2 or 3 Crystals)

Pin 35 : 4.43 (1 Crystal)

OPTION 01

B7B6B5B4B3B2B1BO
B7=Forf: 1 (Motel)
B6= Fors: 1 (Note 1)
B5 = DL : X (De-interface: 0= Interface, 1= De-interface) (**don't care**)
B4 = STB : X (Stand-by) (0= TDA884X in standby mode, 1= 1C
operational) (**don't care**)
B3 = Poc : X (Synchronization mode: 0=Synchronization active,
1 =Synchronization not active) (**don't care**)
B2 = Cm2 : X (Note2) (**don't care**)
B1 = Cm1 : X (Note2) (**don't care**)
BO = CmO : X (Note2) (**don't care**)

Note-1:

Forf, Fors bits: Forced field frequency: This forces the vertical divider in a 60 Hz mode or automatic. In auto mode it can be given a preference for 50 or 60 Hz or to keep the last detected field frequency.

FORF	FORS	Vertical Frequency
0	0	Auto, 60 Hz if not locked
0	1	60 Hz forced (Note c)
1	0	Auto, keep last detected frequency
1	1	Auto, 50 Hz if not locked

Note c: When already locked at 50 Hz, 60 Hz is forced after sync loss.

Note2:

Cm2, Cm1, CmO bits: Colour Decoder Mode: With these bits the automatic mode can be selected or the decoder can be forced to one of the standards. Xtal selection bits **XA** and **XB** should not be contradictory to a forced Xtal selection in the colour decoder mode (e.g. force pin 35 while there is only a Xtal on pin 34).

CM2	CM1	CMO	Colour Decoder Mode
0	0	0	Automatic, own intelligence, 2 Xtals
0	0	1	Forced Xtal pin 34, PAL/NTSC
0	1	0	Forced Xtal pin 34, PAL
0	1	1	Forced Xtal pin 34, NTSC
1	0	0	Forced Xtal pin 35, PAL/NTSC (Note d)
1	0	1	Forced Xtal pin 35, PAL
1	1	0	Forced Xtal pin 35, NTSC
1	1	1	Forced Xtal pin 35, SECAM

Note d: In this mode, the colour oscillator is forced to use one Xtal pin, while the decoder can select PAL or NTSC automatically.

OPTION 02

B7B6B5B4B3B2B1BO
B7 = Oso : 0 (Over-scan Switch-Off: 0= Switch-off undefined,
1 =Switch-off in vertical overscan)
B6 = Vsd : 0 (Vertical Scan Disable: 0=Active Vertical Scan,
1 = Disable Vertical Scan)
B5 = Cb : 0 (Chroma Band pass center frequency: 0= Centre frequency at
Fsc (chroma sub-carrier frequency), 1= Center frequency at
1.1'Fsc)
B4 = Bis : 0 (Blue Stretch: 0= Blue Stretch off, 1= Blue Stretch on)
B3 = Bks : 0 (Black Stretch: 0= Black Stretch off, 1= Black Stretch on)
B2 = le1 : X (Insertion Enable Fast blanking: 1= enable RGB insertion,
0= disable) (**don't care**)
B1 = Afw : X (AFC Window around IF center frequency: 0= Nominal
window, about 80 kHz wide; 1= Enlarged window, about 240 kHz
wide) (**don't care**)
B0= Bb : 0 (Blue Background: 0= Normal operation, 1= **Blue**
background active)

OPTION 03

B7B6B5B4B3B2B1BO
B7 = Hob: Note!
B6 = Bps: 0 (Bypass chroma delay line: 0 Chroma delay line active, 1= Delay line bypassed)
B5 = Acl: X (Automatic Colour Limiting: 0= ACL not needed for standard burst/chroma transmissions; 1= ACL active, **for non** standard chroma-to-burst ratio) (**don't care**)
B4 = Cmb: Note2
B3 = Ast: X (Abs-loop Start-up mode: 0=Automatic mode, RGB **drive** switches on when ABS loop stable; 1 = Switch-on under control of micro controller) (**don't care**)
B2 = CL2: 1 (Note3)
B1 = CL1: 1 (Note3)
BO = CLO: 0 (Note3)

Note1:

0 = Pal+ helper output blanking disabled

1 = Pal+ helper output blanking enabled

Note2: Comb Filter

0 = Pin 33 Low, comb filter off

1 = Sub-carrier output pin 33 active, comb filter **on****Note3:**

CL2,CL1,CLO bits: Cathode drive level:

CL2	CL1	CLO	Variation	Cathode Drive Level
0	0	0	Minimum	
0	0	1	+14%	
0	1	0	+28%	
0	1	1	+42%	
1	0	0	+57%	
1	0	1	+71%	
1	1	0	+85%	
1	1	1	+100%	

OPTION 04

B7B6B5B4B3B2B1BO

B7 = Ifs: X (If sensitivity: 0= Normal Sensitivity, 1 = Maximum gain reduced by 20 dB (reduces the total gain range)) (don't care)

B6 = Mod : X (Modulation standard: 0 = Negative Modulation, 1 = Positive Modulation, AM demodulated sound can be connected to pin 2) (**don't care**)

B5 = VSW: X (Video Mute Switch : 0= Normal Operation, 1 = IF Video signal switched off (pin 6 is forced to ground)) (don't care)

B4 = Sm: X (Sound mute of internal FM demodulator: 0 = Normal Operation, 1 = Sound Muted) (don't care)

B3 = Ds: 0 (Dynamic Skin Control: 1= on, 0= off)

B2 = Dsa: 0 (Dynamic Skin Control Angle: 1= 123 degrees, 0 = 118 degrees)

B1 = Fav: 0 (Fixed Audio Volume: 0= Volume controlled front-end or external audio output at pin 15, 1 = Fixed front-end audio output at pin 15)

BO = Lfa: X (Secam L1 Frequency Adjust: 0= Normal IF Frequency, 1 = IF Frequency shifted for L1 standard (align with IFPL) (**don't care**)**OPTION 05**

B7B6B5B4B3B2B1BO

B7 = Avl: 0 (Automatic Volume Levelling: 1= active, 0= disabled)

B6 = Hbl: X (Wider Horizontal Blanking: 1= blank left+right edges, 0= normal blanking on H-flyback pulse) (don't care)

B5 = Vim: X (Video Ident Mode: 1= Coupled to Source Switch, 0= to IF) (don't care)

B4 = Gai: (Gain of luminance channel: 0= Normal gain of luminance channel (V27 =1Vblack-white) (When CTI is disabled), 1 = High Gain for Luminance Input (When CTI is enabled) (V27=0.45Vpp))

B3 = Ncin: X (Vertical Divider Mode: 0=Normal operation of the vertical divider, 1 = Vertical divide switched to large search window) (**don't care**)

B2 = Stm: X (Search Tuning Mode: 0= Normal operation, 1= Reduced Sensitivity of coincidence detector) (don't care)

B1 = Vid: X (Video Ident Mode: 1 = No influence, 0= IFI controls 01- loop) (don't care)

BO = Lbm: 0 (Long blanking mode: 0= Blanking adapted to standard (50 or 60 Hz), 1= Fixed blanking according 50 Hz standard)

OPTION 06

B7B6B5B4B3B2B1BO

B7 = Hco: X (EHT Tracking mode: 0= EHT tracking only on vertical, 1 = EHT tracking on both vertical and East-West) (don't care)

B6 = EVG: 0 (Enable Vertical Guard: 0= Only vertical guard detection (Output bit NDF), 1 = Detection (NDF) and protection by blanking RGBout)

B5 = SBL: X (Service Blanking: 0= No service blanking, 1 = Service Blanking active) (**don't care**)

B4 = Prd: X (Over-voltage protection input mode: 0= Only over-voltage detection (output bit XPR), 1 = Over- voltage detection (XPR) and inhibit horizontal drive (protection)) (don't care)

B3 = Mat: 0 (TDA8840/4142/44 : PAL/NTSC matrix: 0 = Matrix adapted to standard (Japanese NTSC matrix or PAL matrix), 1 = Forced to PAL matrix)

B2 = Rbl: X (RGB Blanking: 0= Normal picture visible, 1= RGBout (pins 21, 20, 19) blanked) (**don't care**)B1 = Cor: X (Noise coring: 0= Noise coring off; 1 = Noise coring on, reduce peaking function on small transients) (**don't care**)

BO = Aen: (Enable APS: 0= APS disabled » Preset, 1= APS enabled » No Preset)

OPTION 07

B7B6B5B4B3B2B1BO

B7 = C3: Note1

B6 = C2: Note1

B5=C1: Note1

B4 = CO: Note1

B3 = CL: Note2

B2 = Tr: Note3

B1 =L1:Note4

BO = LO: Note4

Note1:

C3, C2, C1 , CO : These bits define country:

0, 0, 0, 0 = ? : Not allowed

0, 0, 0, 1 =D: Germany

0, 0, 1 , 0 =A: Austria

0,0, 1 , 1 =CH: Switzerland

0, 1 , 0 , 0 =1 : Italy

0, 1 , 0 , 1 =F: France

0, 1 , 1 , 0 =B: Belgium

0,1, 1 , 1 =DK: Denmark

1 , 0, 0, 0 = S: Sweden

1, 0, 0, 1 = N: Norway
1, 0, 1, 0 = SF: Finland
1, 0, 1, 1 = GB: Great Britain
1, 1, 0, 0 = NL: Netherlands
1, 1, 0, 1 = P: Portugal
1, 1, 1, 0 = E: Spain
1, 1, 1, 1 = TR: Turkey

Note2:

CL : This bit enables or disables Child Lock function.

0=off

1= On (Active)

Note3:

Tr: This bit enables or disables Turkish language usage.

0= Disabled (3 Languages: English, German and French)

1= Enabled (4 Languages: English, German, French and Turkish)

Note4:

L1, LO : These **bits select menu language:**

0, 0 = English

0, 1 = German

1, 0 = French

1, 1 = Turkish

OPTION 08

B7B6B5B4B3B2B1BO

B7 = Tub : (Tube size: 0= 16 : 9 **Tube size, 1 = 4 : 3 Tube size**)

B6 = Tun : **don't care**

B5 = IfD: Note1

B4 = IfI: Note2

B3 = IfM: Note3

B2 = APS: (To determine whether APS will run at first turning on the TV or not: 0= APS done, 1= APS **set**)

B1 = Hp: (To enable Headphone: 0= No Headphone, 1= Headphone available)

BO = Hue; (In case of NTSC system to enable Hue function: 0= No Hue, 1= Hue Available)

Note1:

IfD

0 = If DK 38.0 MHz

1 = If DK 38.9 MHz

Note2:

IfI

0 = IfI 39.5 MHz (Great Britain I, **Only UHF Tuner**)

1 = IfI 38.9 MHz (Ireland I+, **Standard Tuner**)

Note3:

IfM

0 = If M, N 45.75 MHz S&N American Models, **Tuner UV1336** (Only PAL M, Pal N, NTSC M)

1 = If M, N 38.9 MHz Euro M, **N Models, Standard Tuner**

OPTION 09

B7B6B5B4B3B2B1BO

B7 = NM: (NTSC M) Note1

B6 = PN: (PAL N) Note1

B5 = PM: (PAL M) Note1

B4=K1: Note1

B3 = L: Note1

B2 = I: Note1

B1 = DK: Note1

BO = BG: Note1

Note1:

0 = Standard not supported

1 = Standard available

OPTION 10

B7B6B5B4B3B2B1BO

B7 = Txt: **don't care**

B6 = Weu: Note1

B5 = E/T: Note1

B4 = Corn: (Enable Comb Filter: 0= Comb filter not supported, 1 = Comb filter available)

B3 = Svh: (Enable S-VHS Input: 0= S-VHS not supported, 1 = S-VHS available)

B2 = Fro: (Enable Front-AV (AV-3): 0= Front-AV (AV-3) not supported, 1 = Front AV (AV-3) available)

B1 = Sc2: (Enable Scart2 (AV-2): 0= Scart2 (AV-2) not supported, 1 = Scart2 (AV2) available)

B0= Sc1: (Enable Scarti (AV-1): 0= Scarti (AV-1) not supported (Not a real case), 1=Scart1 (AV-1) available)

Note1: Weu,E/T: Teletext character set table selection

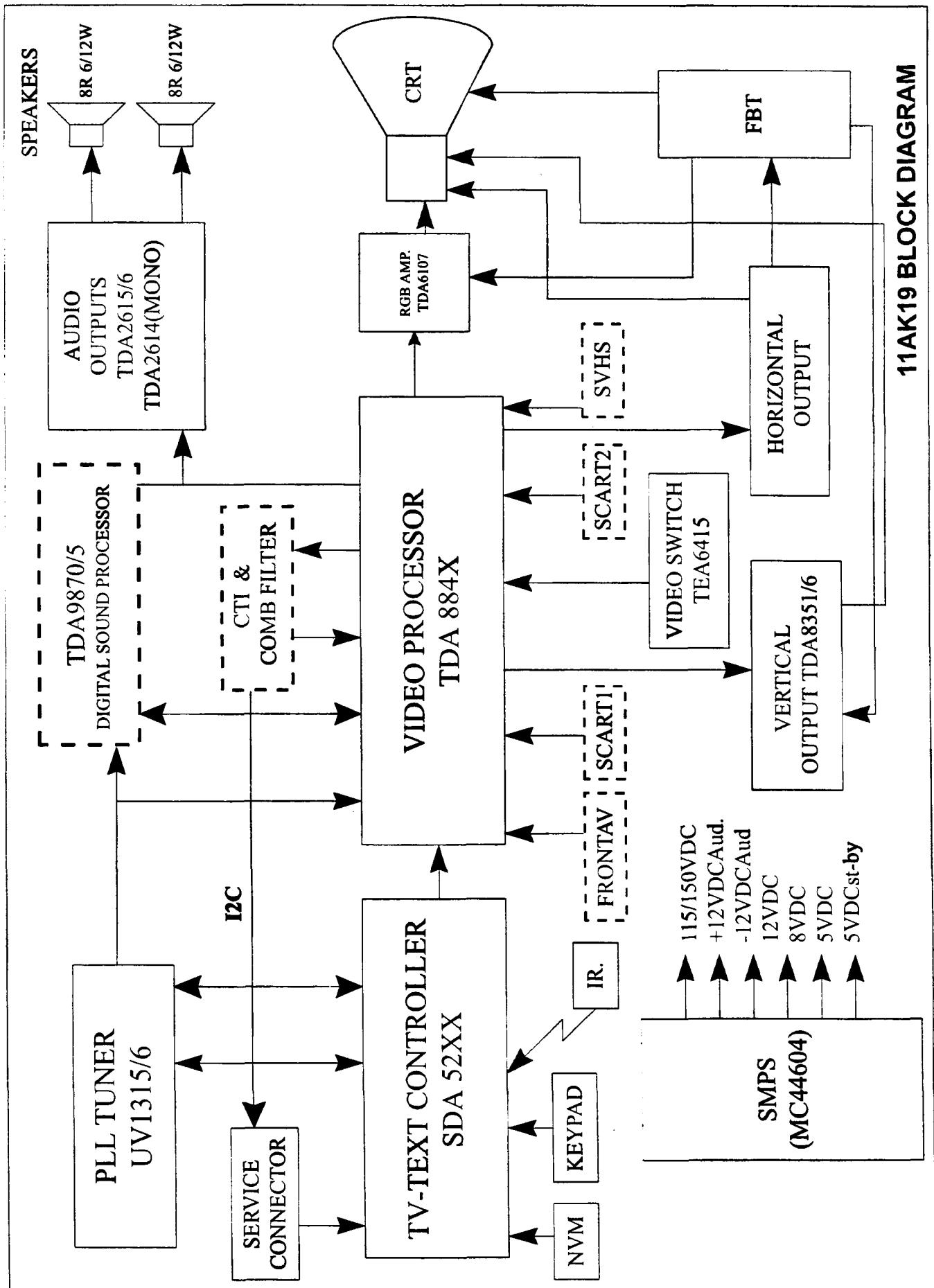
0, 0 = West Europe+Turkish

0, 1 = East Europe

1, 0 = West Europe

1, 1 = West Europe

GENERAL BLOCK DIAGRAM OF CHASSIS AK19

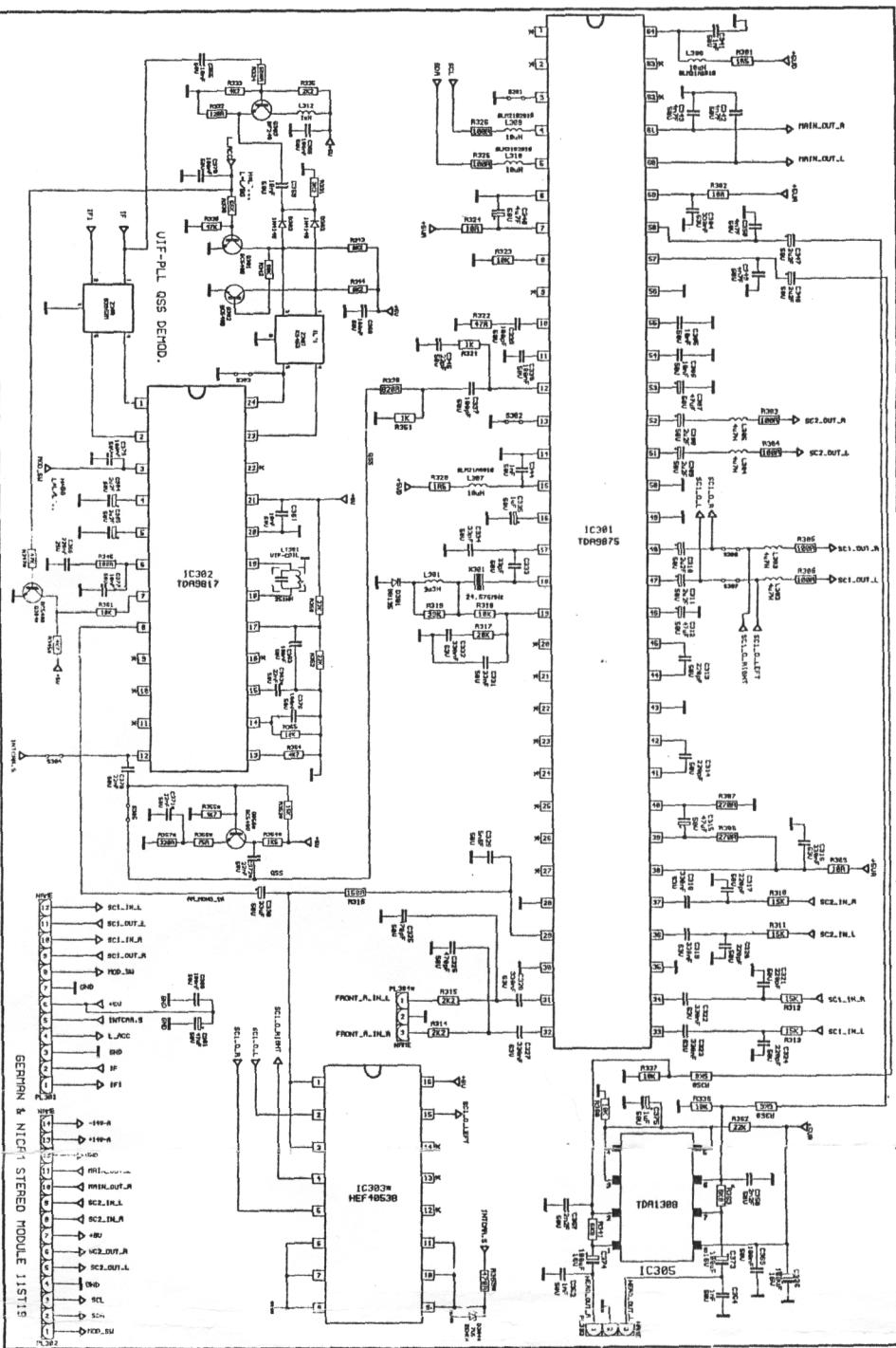


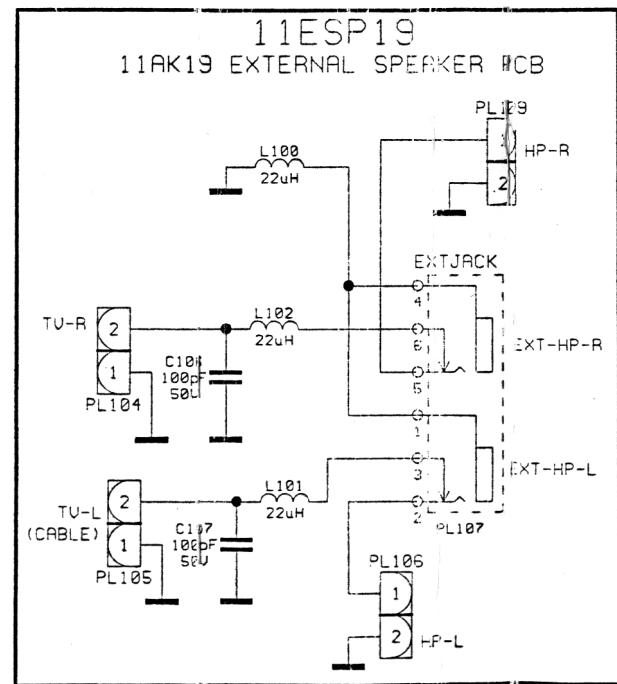
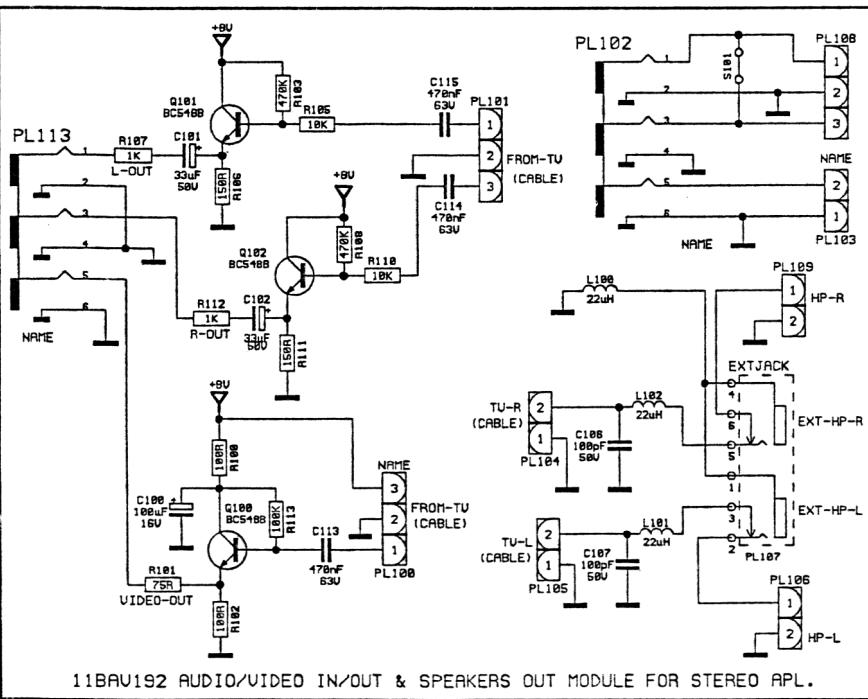
11AK19 BLOCK DIAGRAM

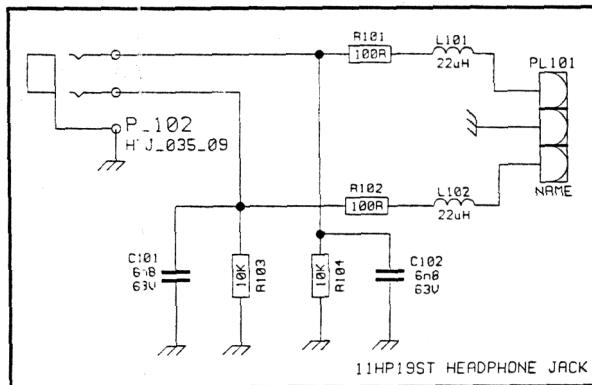
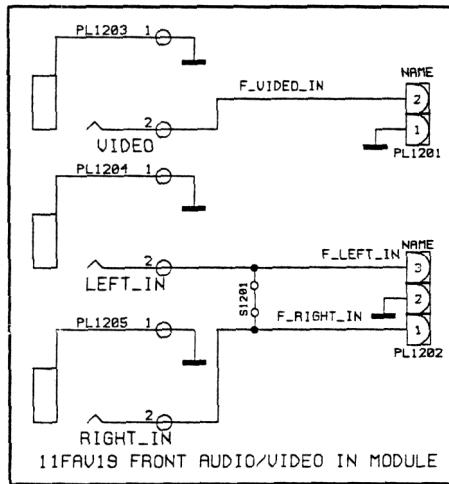
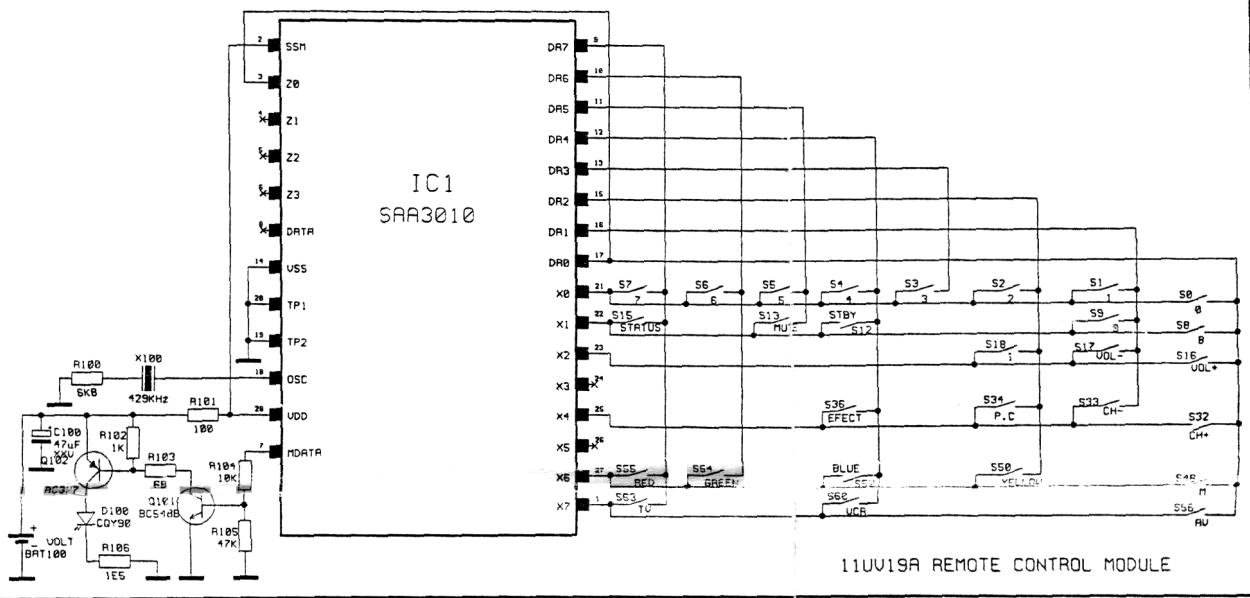
ELECTRONIC COMPONENTS PART LIST

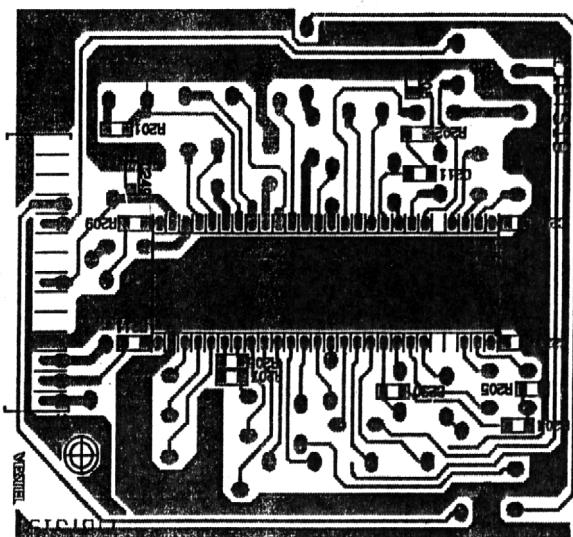
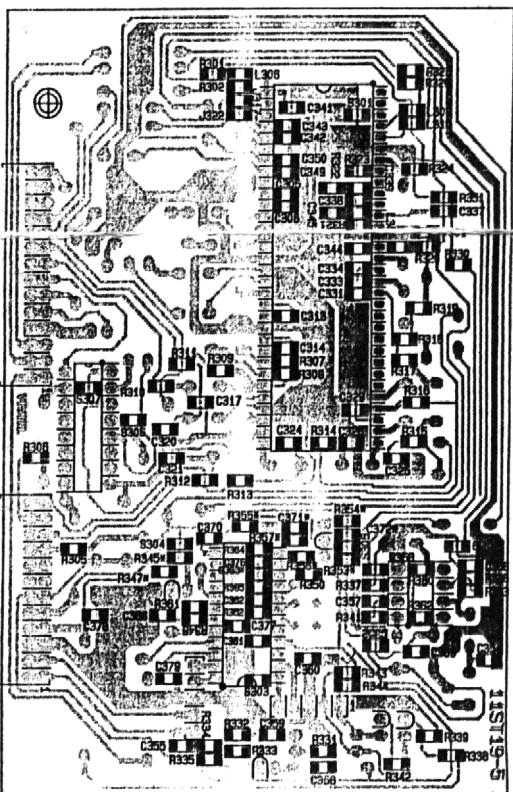
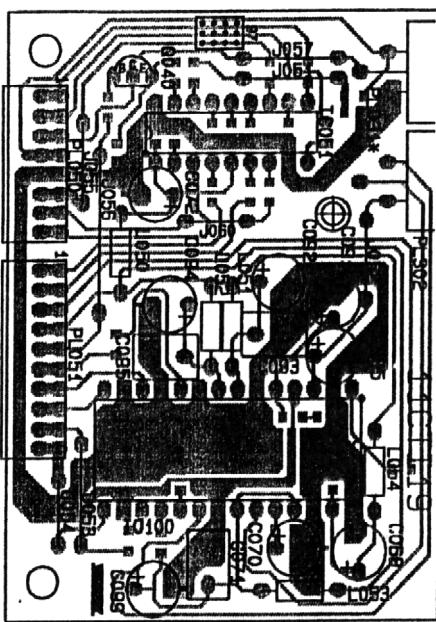
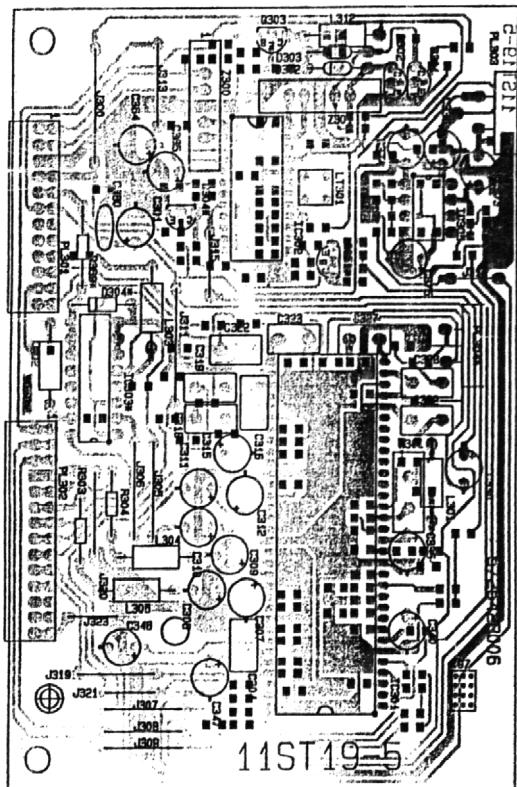
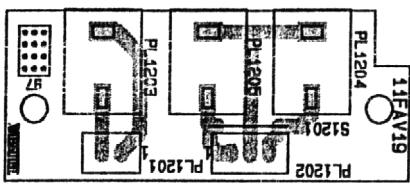
POZ.N(3 VESKOD	DESCRIPTION	POZ.NO	VESCOD	DESCRIPTION
IC804	1005017350 CHSASSY19-1GF32122133231	C373	3081010356	CAPEL100UF16VM
	1007204050 R/C 2040 (NOBRAND)	C374	3081010356	CAP EL 100UF 16V M
	1010000535 SPKASSY.5X/54/55 19ST2/60	C426	3081010456	CAP EL 100UF 25V M
	2002500200 FUSE ASSY.TK79-A (2.5A)	C848	3081010456	CAP EL 100UF 25V M
	2006505080 HEATSINK ASSY. 16/19-REG(2)	C612	3081011054	CAP EL 100UF 63V M
	2006505200 HEATSINKASSY.19-CRTBOARD	C702	3081011054	CAP EL 100UF 63V M
	2006505220 HEATSINKASSY.19-REG&STR	C817	3081020354	CAPEL1000UF16VM
	2006505230 HEAT.A. 19-HOR&VER BAV&EXT.90B	C820	3081020354	CAPEL1000UP16VM
	2006505250 HEAT.ASSY.19-SMPs 90a170-270V	C828	3081020354	CAPEL1000UF 16V M
	2042202060 S.B.ST19-BG/L GS+NI HP FAV	C632	3081020454	CAP EL 1000UF 25V M
	2046400700 BAV B.ASSY.BAV19A-BAV/OUT	C335	3081090856	CAPEL1UF50VM
	2052500680 JACK B.ASSY.HP19SB STEREO	C375	3081090856	CAPEL1UF50VM
	2052500940 FAVB.ASSY.FAV-19STR	C431	3081090856	CAPEL1UF50VM
	2942202003 S.B.ST19-BG/L GS+NI	C516	3082200856	CAP EL 22UF 50V M
	2942202008 S.B.ST19-HEADPHONE	C413	3082210356	CAPEL2200UF16VM
	2942202009 S.B.ST19-FRONTAV	C814	3082210356	CAPEL2200UF16VM
	2946400005 BAV B.ASSY.BAV19-BAV OUT	C845	3082210356	CAPEL220UF16VM
C705	3011031036 CAPMKT10NF63VJ	C847	3082210356	CAPEL220UF16VM
C403	3011041036 CAP MKT 100NF 63V J	C823	3082220454	CAPEL2200UF25VM
C435	3011041036 CAP MKT 100NF 63V J	C826	3082220454	CAPEL2200UF25VM
C436	3011041036 CAP MKT 100NF 63V J	C308	3082290856	CAPEL2.2UF50VM
C483	3011041036 CAP MKT 100NF 63V J	C309	3082290856	CAP EL 2.2UF 50V M
C709	3011041036 CAP MKT 100NF 63V J	C310	3082290856	CAPEL2.2UF50VM
C807	3011041036 CAP MKT 100NF 63V J	C311	3082290856	CAPEL2.2UF50VM
C605	3011041548 CAP MKT 100NF 250V K DL	C347	3082290856	CAPEL2.2UF50VM
C901	3011041548 CAP MKT 100NF 250V K DL	C348	3082290856	CAPEL2.2UF50VM
C801	3011041558 CAP MKT 100NF 250V M AC	C364	3082290856	CAP EL 2.2UF 50V M
C802	3011041558 CAP MKT 100NF 250V M AC	C365	3082290856	CAP EL 2.2UF 50V M
C707	3012231136 CAPMKT22NF100VJ	C407	3082290856	CAP EL 2.2UF 50V M
C051	3012241036 CAP MKT 220NF 63V J	C437	3082290856	CAPEL2.2UF50VM
C053	3012241036 CAP MKT 220NF 63V J	C101	3083300856	CAP EL 33UF 50V M
C054	3012241036 CAP MKT 220NF 63V J	C102	3083300856	CAP EL 33UF 50V M
C071	3012241036 CAP MKT 220NF 63V J	C330	3083300856	CAP EL 33UF 50V M
C415	3012241036 CAP MKT 220NF 63V J	C449	3083300856	CAP EL 33UF 50V M
C706	3012241036 CAP MKT 220NF 63V J	C601	3083300856	CAP EL 33UF 50V M
C518	3013331036 CAP MKT 33NF 63V J	C606	3083301354	CAP EL 33UF 160V M
C519	3013331036 CAPMKT33NF63VJ	C500	3083390856	CAPEL3.3UF50VM
C522	3013331036 CAP MKT 33NF 63V J	C618	3083391356	CAP EL 3.3UF 160V M
C854	3013331036 CAPMKT33NF63VJ	C201	3084700856	CAPEL47UF50VM
C304	3013341036 CAP MKT 330NF 63V J	C301	3084700856	CAP EL 47UF 50V M
C316	3013341036 CAPMKT330NF63VJ	C307	3084700856	CAP EL 47UF 50V M
C318	3013341036 CAP MKT 330NF 63V J	C312	3084700856	CAPEL47UF50VM
C319	3013341036 CAP MKT 330NF 63V J	C315	3084700856	CAPEL47UF50VM
C322	3013341036 CAP MKT 330NF 63V J	C505	3084700856	CAP EL 47UF 50V M
C323	3013341036 CAP MKT 330NF 63V J	C829	3084701358	CAP EL 47UF 160V M (HR)
C327	3013341036 CAP MKT 330NF 63V J	C607	3084710354	CAPEL470UF16VM
C328	3013341036 CAP MKT 330NF 63V J	C114	3084710854	CAPEL470UF50VM
C332	3013341036 CAP MKT 330NF 63V J	C115	3084710854	CAP EL 470UF 50V M
C521	3013341036 CAP MKT 330NF 63V J	C813	3084720354	CAPEL4700UF16VM
C604	3014731036 CAP MKT 47NF 63V J	C340	3084790856	CAPEL4.7UF50VM
	3014731136 CAPMKT47NF100VJ	C432	3084790856	CAPEL4.7UF50VM
C112	3014741036 CAP MKT 470NF 63V J	C804	3101511955	CAPEL150UF400VM
C113	3014741036 CAP MKT 470NF 63V J	C846	3201021156	CAPCER1NF1KVMB
C113	3014741036 CAP MKT 470NF 63V J	C850	3201021156	CAPCER1NF1KVMB
C704	3014741036 CAP MKT 470NF 63V J	C851	3201021156	CAPCER1NF1KVMB
C610	3031043038 CAP MKP 100NF 250V J	C852	3201021156	CAPCER1NF1KVMB
C833	3032215048 CAP MPP 0.22NF 630V K	C903	3201024148	CAPCER1NF2KVKB
can	3034735038 CAP MKP 47NF 630V J	C860	3202227458	CAP CER 2.2NF 4KV M
C617	3035643038 CAP MKP 560NF 250V J	C821	3204711146	CAP CER470PF 1KVKB
C611	3037827078 CAP MKP 7.8NF 1.6KV 3.5%	C824	3204711146	CAP CER470PF 1KVKB
C808	3061020146 CAPCER1NF50VKB	C827	3204711146	CAP CER 470PF 1KV KB
C809	3061020146 CAPCER1NF50VKB	R332	3311211030	RESMD1/10W120RJ(0805)
C855	3061020146 CAPCER1NF50VKB	R587	3311220437	RESCF1/4W1.2KJ
C853	3061030396 CAPCER10NF50VZF	R901	3311520237	RESCF1/2W1.5KJ
C380	3061040396 CAP CER 100NF 50V Z F	R902	3311520237	RESCF1/2W1.5KJ
C816	3061040396 CAP CER 100NF 50V ZF	R903	3311520237	RESCF1/2W1.5KJ
C819	3061040396 CAP CER 100NF 50V ZF	R905	3311520237	RESCF1/2W1.5KJ
C822	3061040396 CAP CER 100NF 50V ZF	R906	3311520237	RESCF1/2W1.5KJ
C825	3061040396 CAP CER 100NF 50V ZF	R816	3311550237	RESCF1/2W1.5M J (400V)
C830	3061040396 CAP CER 100NF 50V ZF	R860	3312250237	RESCF1/2W2.2M J (400V)
C832	3061040396 CAP CER 100NF 50V ZF	R457	3312251030	RES SMD 1/10W 2.2M J
C406	3062230396 CAPCER22NF50VZF	R620	3351020237	RES MO 1/2W 1KJ
C904	3062724146 CAP CER 2.7NF 500V KB	R630	3351020237	RES MO 1/2W 1KJ
C608	3063330146 CAP CER 33NF 50V KB	R610	3352222137	RES MO 2W 2.2K J
C806	3068210146 CAPCER 820PF 50V KB	R806	3352232137	RES MO 2W 22K J
C068	3081000856 CAPEL10UF50VM	R822	3352233137	RES MO 22K 3W J
C102	3081000856 CAPEL10UF50VM	R870	3353381134	RES MO 1W 0.33R J
C203	3081000856 CAPEL10UF50VM	R704	3361010437	RES FUSE 1/4W100RJ
C204	3081000856 CAPEL10UF50VM	R611	3361091137	RES FUSE 1 W 1 R J
C402	3081000856 CAPEL10UF50VM	R628	3362700237	RES FUSE 1/2W27RJ
C405	3081000856 CAPEL10UF50VM	R845	3374750237	RES MG 1/2W 4.7M J
C410	3081000856 CAPEL10UF50VM	R817	3382295130	RES WW 5W 2.2R J RAD.
C428	3081000856 CAPEL10UF50VM	TH801	3391803000	THERM.PTC DEGAUSS DUAL 250V
C440	3081000856 CAPEL10UF50VM	LD501	3519029300	LED RED/GREEN LTL293SJ
C507	3081000856 CAPEL10UP50VM	0301	3520501350	DIODE VARBB135
C514	3081000856 CAPEL10UF50VM	D201	3531941480	DIODE 1N4148

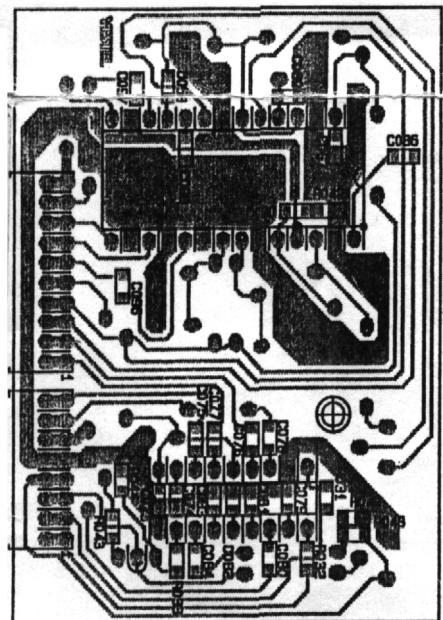
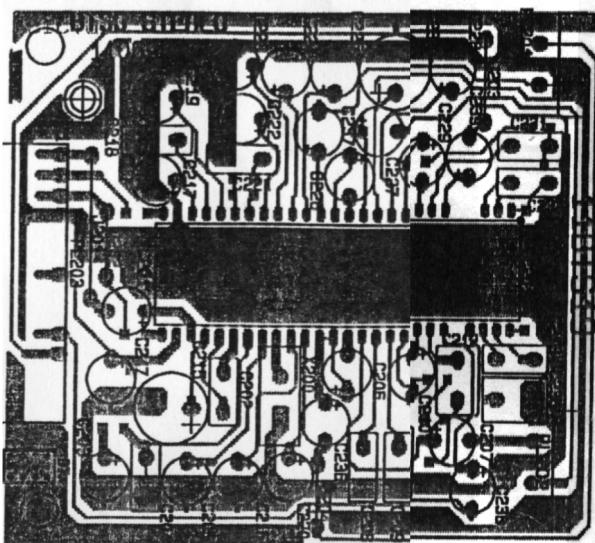
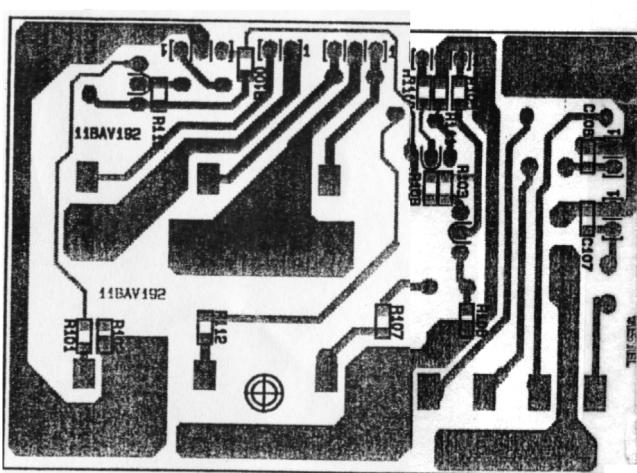
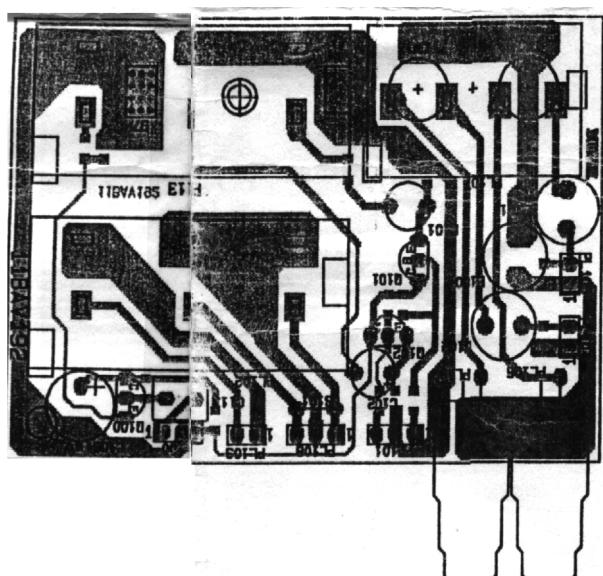
POZ.NO	VESKOD	DESCRIPTION	POZ.NO	VESCOD	DESCRIPTION
C517	3081000856	CAPEL10UF50VM	D302	3531941480	DIODE 1N4148
C570	3081000856	CAPEL10UF50VM	D303	3531941480	DIODE 1N4148
C560	3081000856	CAPEL10UF50VM	D420	3531941480	DIODE 1N4148
C625	3081001454	CAPEL10UF250VM	0503	3531941480	DIODE 1N4148
C902	3081001454	CAPEL10UF250VM	0504	3531941480	DIODE 1N4148
C02S	3081010356	CAPEL100UF16VM	0506	3531941480	DIODE 1N4148
C100	3081010356	CAPEL100UF16VM	0507	3531941480	DIODE 1N4148
C336	3081010356	CAPEL100UP16VM	0508	3531941480	DIODE 1N4148
D509	3531941480	OIODE1N4148	PL404	3861501401	CONN.MALE 14P MOLEX
0510	3531941480	OIOOE1N4148	PL302	3861501402	CONN.FEMALE 14P MOLEX
0602	3531941480	OIOOE1N4148	PL601	3861820406	HRZVRTCONN.(4P)
0603	3531941480	OIODE1N4148	PL900	3862021001	SOCKET CRT NARROWNECK W/GND
0607	3531941480	DIODE 1N4148	SC050	3862050004	SOCKET SCART (R)
0608	3531941480	DIODE 1N4148	SC051	3862050004	SOCKET SCART (R)
0701	3531941480	DIODE 1N4148	PL113	3863010315	JACK RCA 3P (BACK AV) 180a
0823	3531941480	DIODE 1N4148	PL1204	3863011021	RCA JACK 1P WHITE (180e)
0816	3551500261	DIODE BYM26D	PL1205	3863011022	RCA JACK 1P RED (180B)
0814	3551500953	DIODE BYW95A	PL1203	3863011023	RCA JACK 1P YELLOW (1800)
0815	3551500953	DIODE BYW95A	PL102	3863120300	JACK HEADPHONE STEREO WO/SW
0811	3551900331	DIODE BYD33D	TU201	3924224317	TUNER WSP (PLL) 38.9 MK2
0812	3551900331	DIODE BYD33D		3962112128	CRT 21/VCL A51 EFS83X191
0813	3551900331	DIODE BYD33D		3970801505	SPEAKER 8R15W (77-128)
0605	3551901570	DIODE BA157	L309	4010000025	FERRITE BEAD (805) BLM21B201S
0606	3551901570	DIODE BA157	L306	4010000032	FERRITE BEAT (805) BLM21A601S
0609	3551901570	DIODE BA157	L307	4010000032	FERRITE BEAT (805) BLM21A601S
0601	3551901590	DIODE BA159	L201	4011104512	FIXEO COIL 1UH 045 M-A
0805	3551901590	DIODE BA159	L312	4011104512	FIXEO COIL 1UH 045 M-A
0807	3551901590	DIODE BA159	L801	4011225511	FIXED COIL 2.2UH 055 M-AX
0818	3551901590	010DEBA159	L301	4011336522	FIXED COIL 3.3UH 065 K
0826	3551901590	DIODE BA159	L402	4011336522	FIXED COIL 3.3UH 065 K
0827	3551901590	DIODE BA159	L302	4011477022	FIXED COIL 4.7UH Q70 K-A
0801	3551940070	DIODE 1N4007	L303	4011477022	FIXED COIL 4.7UH Q70 K-A
D802	3551940070	DIODE 1N4007	L304	4011477022	FIXED COIL 4.7UH 070 K-A
0803	3551940070	DIODE 1N4007	L305	4011477022	FIXED COIL 4.7UH Q70 K-A
0804	3551940070	DIODE 1N4007	L501	4011685026	FIXED COIL 6.8UHKRAD
0901	3551940070	DIODE 1N4007	L403	4011687522	FIXED COIL 6.8UH Q75 K
0902	3551940070	DIODE 1N4007	L405	4012106522	FIXED COIL 10UH 065 K-A
0903	3551940070	DIODE 1N4007	L406	4012106522	FIXED COIL 10UH 065 K-A
0408	3570008200	DIODE 2ENER 8.2V	L407	4012106522	FIXED COIL 10UH 065 K-A
0819	3570011000	DIODE ZENER11V	L502	4012106522	FIXED COIL 10UH 065 K-A
0505	3571903600	DIODE ZENER 3.6V 2PD	L503	4012106522	FIXED COIL 10UH 065 K-A
0604	3571933000	DIODE 2ENER 33V U2T 33B	L101	4012224022	FIXED COIL 22UH 040 K
Q810	3610902260	TRMCR22-6	L102	4012224022	FIXED COIL 22UH 040 K
Q802	3610936000	TR MTP3N60E	L803	4013150017	COIL CHOKE 150UH 0.82A RAD
Q303	3611502400	TR BF240	L050	4013155022	FIXED COIL 150UH 050 K (RAD)
0604	3611506390	TR BC639	L051	4013155022	FIXED COIL 150UH 050 K (RAD)
0605	3611525060	TR 250DF	LT401	4020150002	ADJ COIL 150NH 050
IC303	3620040530	1C HEF4053BP (MN4053B)	LT301	4020251002	ADJ COIL 251NH 050
IC807	3620078050	ICLM78M05BIG	TR602	4030001909	TRFFBT90a(AK19)
IC802	3620946040	1C MC44604P	TR802	4041804900	TRFSMPSAK1990e (170-270V)
IC805	3620978080	1CLM7808	TR601	4050001902	LINE DRIVER NEW TYPE
IC801	3621100800	1C CQY80NG (OPT.COUPLER)	TR801	4060001100	LINE FILTER 2-27MH
Q809	3621104310	IC TL431		4072109011	DEGAUSS COIL&EARTH CABLE (21)
IC305	3621513080	ICTDA1308	L603	4090109000	LINEARITY COIL 50UH (06-06A)
IC100	3621526150	ICTDA2615	SW801	4390122000	SWITCH ON/OFF PANASONIC
1C901	3621561070	ICTDA6107Q/N1C	SW501	4390407100	SWITCH TACT SKHHLU
1C701	3621583560	1C TDA8356	SW502	4390407100	SWITCH TACT SKHHLU
IC401	3621588420	1C TDA8842	SW503	4390407100	SWITCH TACT SKHHLU
IC302	3621598180	ICTDA9818	SW504	4390407100	SWITCH TACT SKHHLU
IC301	3621598750	1C TDA9875	PL100	4930250300	CONN.ASSY.3/25 SHIELD BLUE CON
	3621624080	1C ST24C08	PL101	4930250301	CONN.ASSY.3/25 SHIELD GRAY CON
IC050	3621664150	ICTEA6415C		4930280300	CONN.ASSY.3/28 SHIELD BLUE CON
	3621678050	1CL7805CVSGS		4930280301	CONN.ASSY.3/28 SHIELD GREY CON
IC501	3621852551	1C SDA5255 (AK19) PLL/ATS		4930450400	CABLE 4/45 PC (FLAMAN) WO/SOC
	3622408000	IC24C08001155B10011510200		4930450401	CONN.ASSY.4/45 R26 (HRZ&VER)
M0501	3660536000	PREAMPLIFIER TFMS5360		4930450502	CABLE 5/45FC (RGB AK19) WO/SOC
2300	3750239530	FILTER SAW OFWK3953M		4930500204	CONN.ASSY.2/50 R2.6 SPK(R)
Z401	3750239530	FILTER SAW OFWK3953M		4930500215	CONN.ASSY.2/50 W/BLK SPK(L)
Z301	3750294540	FILTER SAW L9454	PL1201	4930550202	CONN.ASSY.2/55 W/SHIELD BLUE
2209	3780105500	FILTER SER TRAP TPS 5.5MH2	PL101	4930550301	CONN.3/55 W/RED(HEADPHONE)
	3807250050	FUSE 2.5A 250V 5-20MM	PL1202	4930550302	CONN.ASSY.3/55 W/SHIELD GREEN
X301	3840124510	XTAL 24.576MH2		4941412415	POWER CORD ASSY.(2.4MT W/FTZ)
X401	3840144310	XTAL 4.433619 MH2		5124030022	BRACKETHPXX55/657282/92(19)
X501	3840418020	REZ18MH2		5127025023	SHIELD AK19 SIDE
PL100	3861200204	CONN.MALE 2P (2052) GRAY		5127025024	SHIELD AK19 (TOP)
PL101	3861200206	CONN.MALE (2052) BLACK		5127025026	SHIELD AK19 (BOTTOM W/PVC)
PL056	3861200211	CONN.MALE 2P (2052) BLUE		5326065097	HEATSINK 16/19-REGULATOR(2)
PL058	3861200301	CONN.MALE 3P (2003) GRAY		5326065150	HEATSINK 19-CRT BOARD
PL059	3861200303	CONN.MALE 3P (2003) BLUE		5326065156	HEATSINK 19-REG&AUDIO
PL303	3861200307	CONN.MALE 3P(2703) RED		5326065157	HEATSINK 19-HOR&VER BACKAV 90-
PL304	3861200308	CONN.MALE 3P(2703) GREEN		5326065159	HEATSINK 19-PRIMER90'
PL304	3861200308	CONN.MALE 3P(2703) GREEN	F801	5357055001	FUSE HOLDER TK79-A
PL050	3861200501	CONN.MALE 5P (2005)		5501035023	HEATSINK BRACKET
PL801	3861500200	CONN.MALE 2PMOLEX		5501035024	BRACKET HEATSINK BACK AVAK19
	3861500201	CONN.FEMALE 2P MLX			
PL403	3861501201	CONN.MALE 12PMOLEX			
PL301	3861501202	CONN.FEMALE 12PMOLEX			

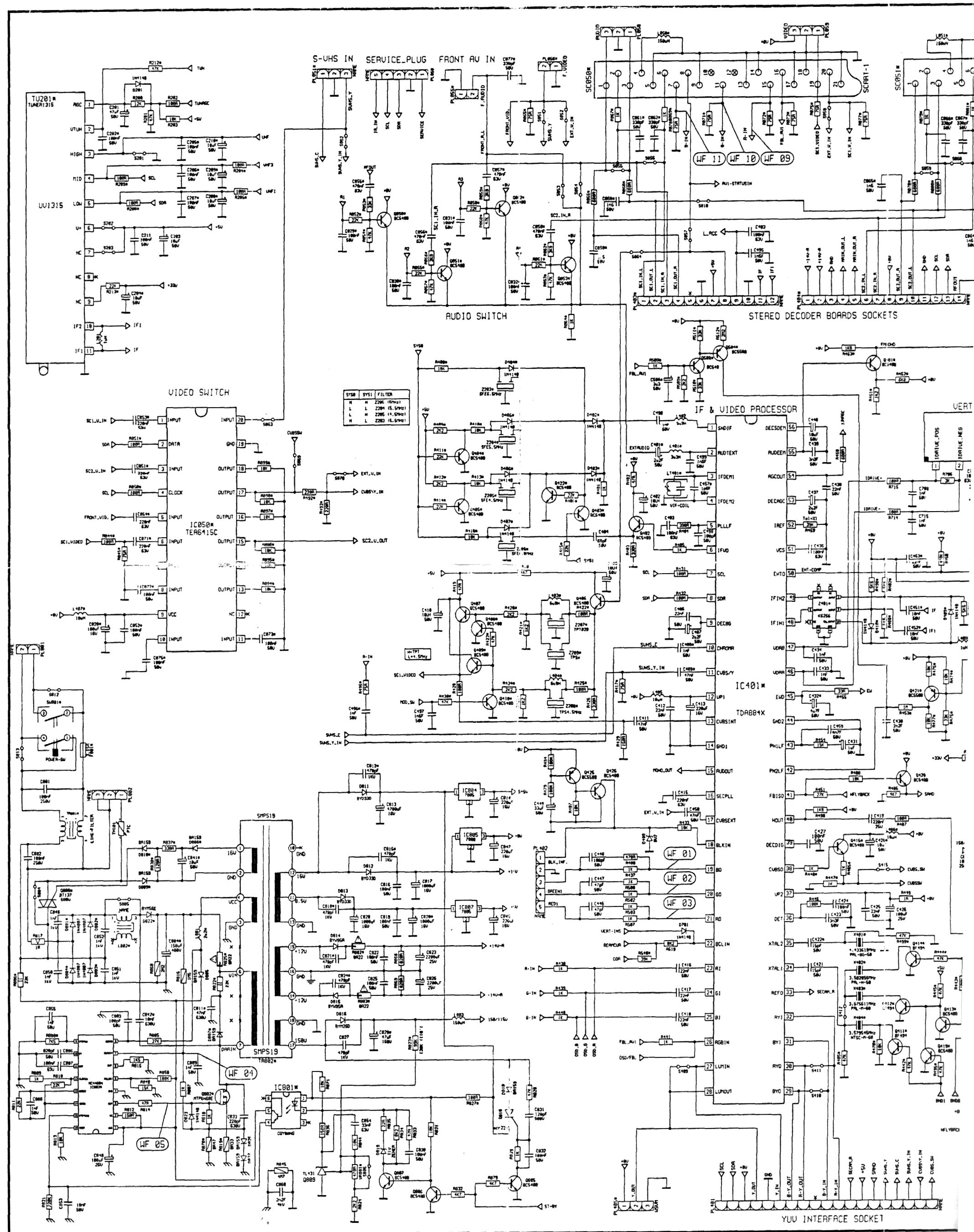
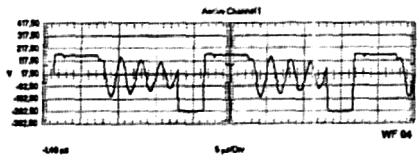
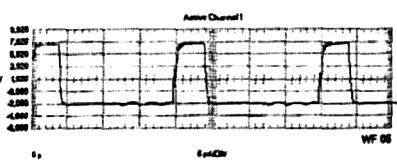
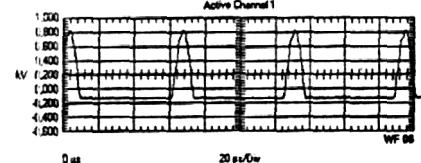
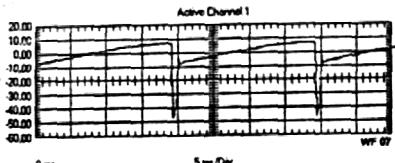


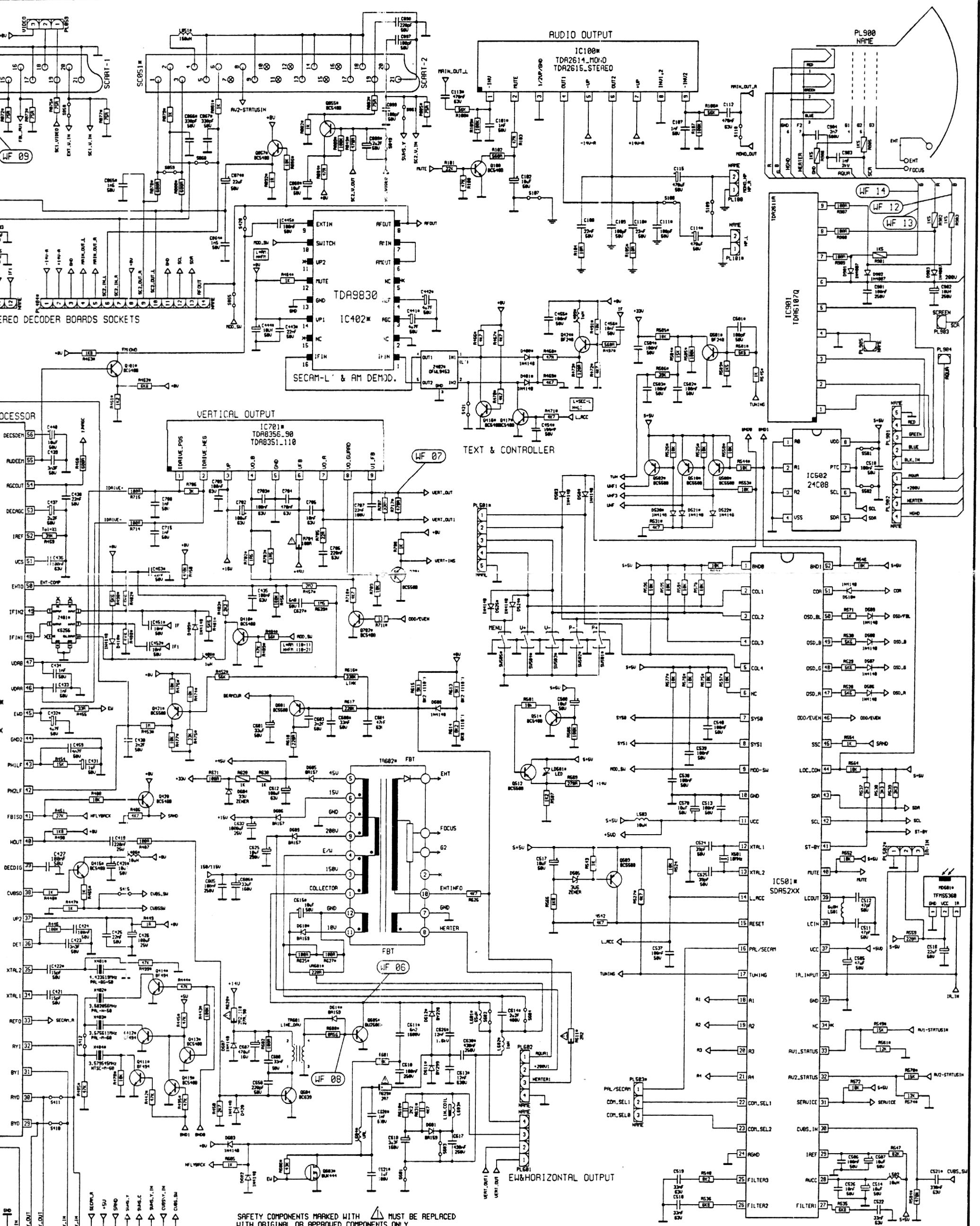




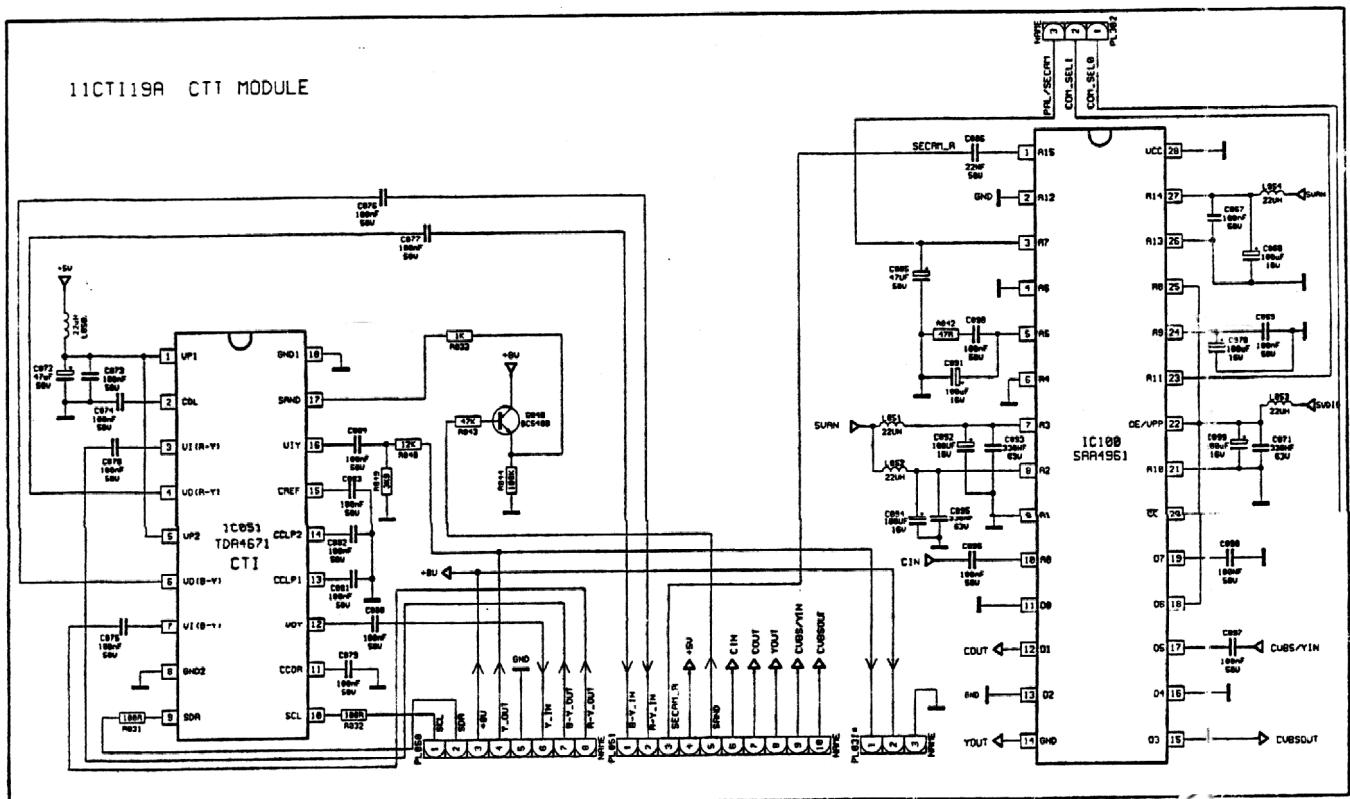
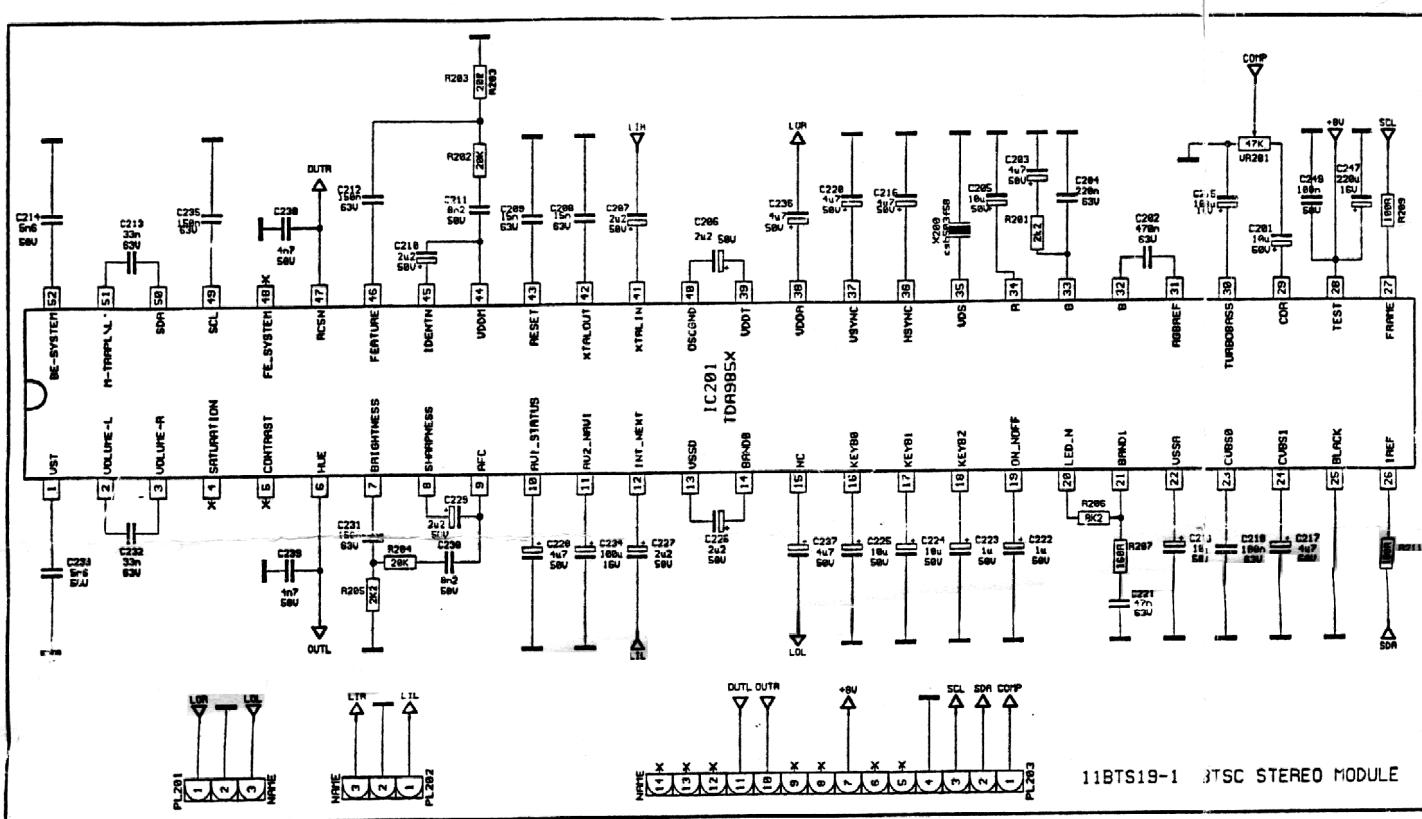








11AK19 MAIN CHASSIS



14AK19-4B

5725300092

D03

U201

U202

U203

U204

U205

U206

U207

U208

U209

U210

U211

U212

U213

U214

U215

U216

U217

U218

U219

U220

U221

U222

U223

U224

U225

U226

U227

U228

U229

U230

U231

U232

U233

U234

U235

U236

U237

U238

U239

U240

U241

U242

U243

U244

U245

U246

U247

U248

U249

U250

U251

U252

U253

U254

U255

U256

U257

U258

U259

U260

U261

U262

U263

U264

U265

U266

U267

U268

U269

U270

U271

U272

U273

U274

U275

U276

U277

U278

U279

U280

U281

U282

U283

U284

U285

U286

U287

U288

U289

U290

U291

U292

U293

U294

U295

U296

U297

U298

U299

U300

U301

U302

U303

U304

U305

U306

U307

U308

U309

U310

U311

U312

U313

U314

U315

U316

U317

U318

U319

U320

U321

U322

U323

U324

U325

U326

U327

U328

U329

U330

U331

U332

U333

U334

U335

U336

U337

U338

U339

U340

U341

U342

U343

U344

U345

U346

U347

U348

U349

U350

U351

U352

U353

U354

U355

U356

U357

U358

U359

U360

U361

U362

U363

U364

U365

U366

U367

U368

U369

U370

U371

U372

U373

U374

U375

U376

U377

U378

U379

U380

U381

U382

U383

U384

U385

U386

U387

U388

U389

U390

U391

U392

U393

U394

U395

U396

U397

U398

U399

U400

U401

U402

U403

U404

U405

U406

U407

U408

U409

U410

U411

U412

U413

U414

U415

U416

U417

U418

U419

U420

U421

U422

U423

U424

U425

U426

U427

U428

U429

U430

U431

U432

U433

U434

U435

U436

U437

U438

U439

U440

U441

U442

U443

U444

U445

U446

U447

U448

U449

U450

U451

U452

U453

U454

U455

U456

U457

U458

U459

U460

U461

U462

U463

U464

U465

U466

U467

U468

U469

U470

U471

U472

U473

U474

U475

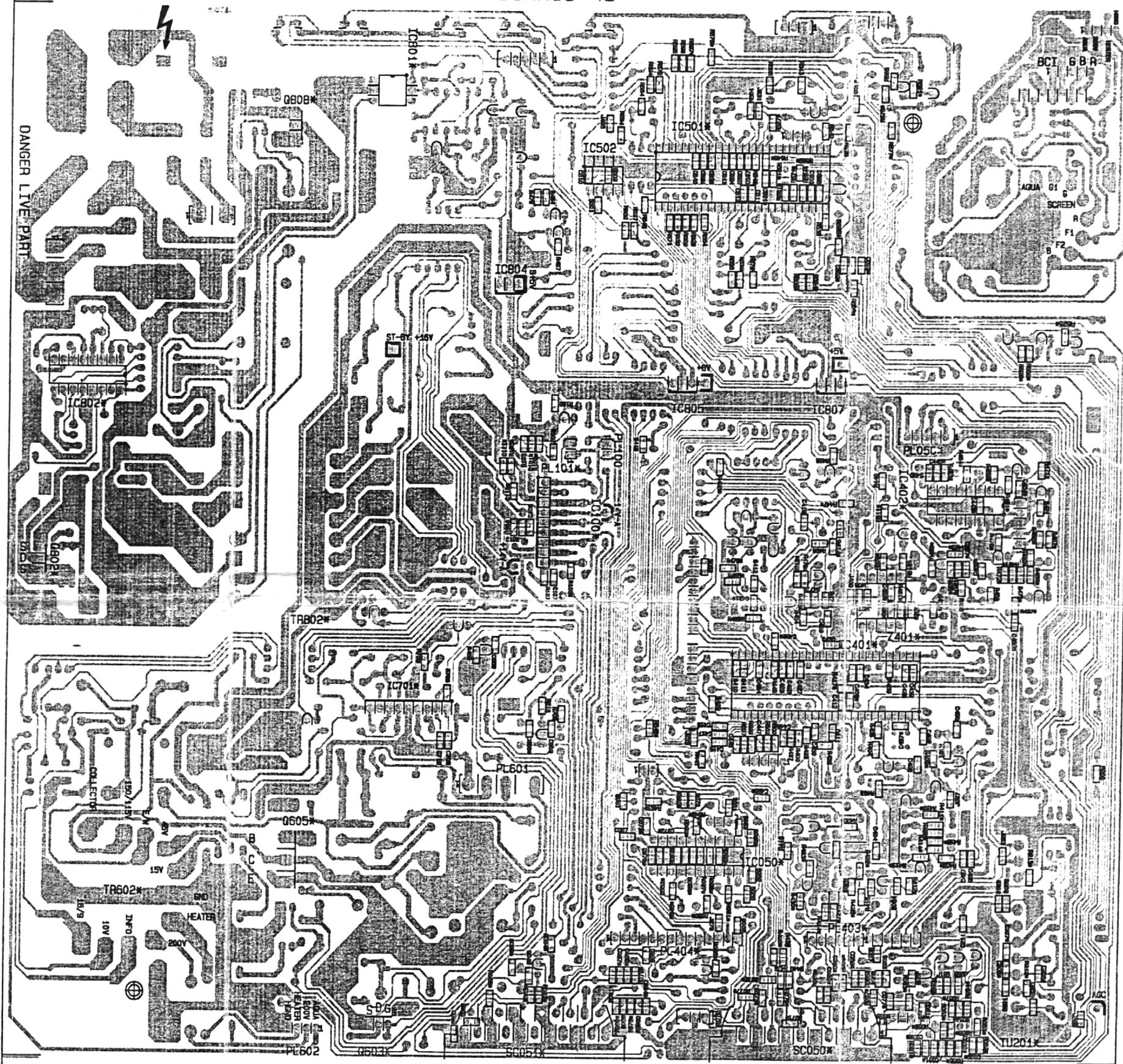
U476

U47

11AK19-4B

1180 60

DANGER LIVE PART



VESTEL

11AK19

MODEL

SERVICE MANUAL
